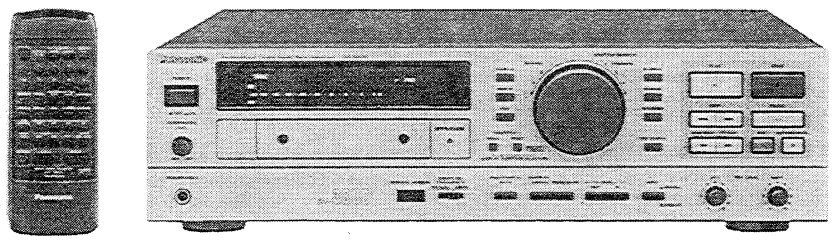
Service Manual

Professional Digital Audio Tape Recorder

SV-3800E-H
SV-3800EB-H

RA1001 MECHANISM SERIES



Panasonic®

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Specifications

Signal format

Tape recording system:	Rotary head type DAT
Sampling frequencies (selected automatically):	
Analog input recording	48 kHz, 44.1 kHz
Playback/Digital input recording	48 kHz, 44.1 kHz, 32 kHz
No. of quantizing bits:	16-bit linear
No. of channels:	2 (stereo)

Audio parameters

(Recording and Playback System)

Frequency response:	
fs: 48 kHz	10 Hz–22000 Hz (±0.5 dB)
fs: 44.1 kHz	10 Hz–20000 Hz (±0.5 dB)
fs: 32 kHz (only playback)	10 Hz–14500 Hz (±0.5 dB)
Total harmonic distortion:	Less than 0.03% (+4 dBu, 1 kHz)* Less than 0.007% (+22 dBu, 1 kHz)*
Dynamic range:	Greater than 92 dB*
S/N:	Greater than 92 dB*
Wow and flutter:	Unmeasurable

*DIN audio weighted (22.4 Hz to 22.4 kHz bandpass filter)

Terminals

Analog input:	
Input jacks	XLR-3 type
Nominal input level (–18 dB rec level)	+4 dBu
Input impedance	10 kΩ balanced
Analog output:	
Output jacks	XLR-3 type
Nominal output level (–18 dB)	+4/–10 dBu
Output impedance	50 Ω balanced
Headphones output:	
Maximum level	30mW+30mW (32 Ω)
Matching impedance	8–600 Ω
Digital (AES/EBU type):	
Input	XLR-3 type/110 Ω balanced
Output	XLR-3 type/110 Ω balanced
Digital (IEC type II):	
Input	RCA phono type (Coaxial)/75 Ω, Optical
Output	RCA phono type (Coaxial)/75 Ω, Optical

Remote control

Parallel remote:	8 pin DIN connector (50 functions available)

Mechanism

Cylinder diameter:	30 mm
Cylinder rotation speed:	2000 r/min.
Tape speed:	
(Normal track)	8.150 mm/s
(Wide track: Music tape)	12.225 mm/s
Search speed:	Up to 250 times normal playback speed
FF/Rewind speed:	Up to 250 times normal playback speed
FF/Rewind time:	Approx. 35 s (2 hours DAT tape)

General

Power consumption:	30 W
Power supply:	AC 50 Hz, 230–240 V
Dimensions (W×H×D):	430×122×315 mm
Weight:	5.9 kg

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

INTRODUCTION

This Service Manual Contains the technical information which service personnel to understand and service the Panasonic Digital Tape Recorder (DAT) model SV-3800.

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Caution for AC Mains Lead

(For United Kingdom)

("EB" area code model only)

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

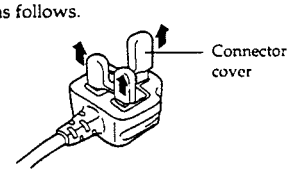
IMPORTANT A 5 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark or BSI mark on the body of the fuse. IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.
If a new plug is to be fitted please observe the wiring code as shown below. If in any doubt please consult a qualified electrician.

IMPORTANT The wires in this mains lead are coloured in accordance with the following code:
Green-and-Yellow: Earth
Blue: Neutral Brown: Live

WARNING THIS APPLIANCE MUST BE EARTHED.

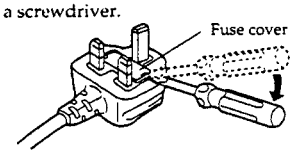
Before use

Remove the connector cover as follows.

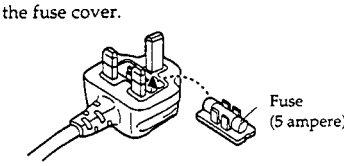


How to replace the fuse

1 Remove the fuse cover with a screwdriver.



2 Replace the fuse and attach the fuse cover.



■CONNECTIONS

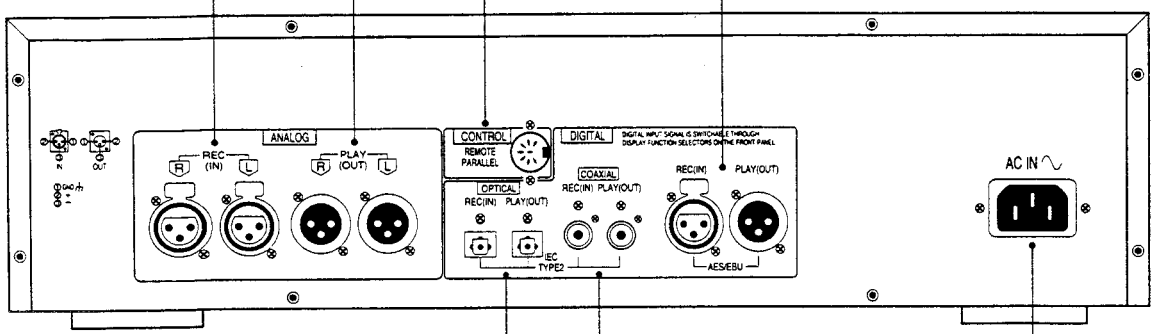
Rear Panel

ANALOG IN terminals
These are balanced analog audio XLR input connectors.

ANALOG OUT terminals
These are balanced analog audio XLR output connectors.

REMOTE CONTROL jack (PARALLEL)
See page 7.

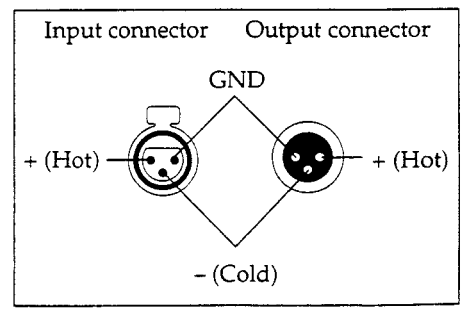
AES/EBU terminals (IN/OUT)
These terminals are for input or output of signals for the professional digital interface.



AC IN jack
Connect to the grounded AC outlet with the included AC power supply cord.

IEC (IEC 958 for consumer use) coaxial jacks (IN/OUT)
These terminals are for input or output of digital signals from/to a consumer unit by using the coaxial cable.

IEC (IEC 958 for consumer use) optical terminals (IN/OUT)
These terminals are for input or output of digital signals from/to a consumer unit by using the optical cable.



When making digital IN/OUT connections

If the connections to studio equipment are set incorrectly, a loop may be set up where the output of the unit is connected to its recording input. This will not only set up an oscillation but may also damage the monitor speakers. Attention should therefore be paid to the following points:

1) When recording or playing back through the unit's DIGITAL IN/OUT terminals, be sure to connect these terminals to the DIGITAL PLAYBACK (IN)/DIGITAL REC OUT (OUT) terminals of other equipment.

2) If the monitor amplifier has no DIGITAL PLAYBACK or DIGITAL REC OUT terminals, this unit (DAT) can be used only for playback through the ordinary DIGITAL INPUT terminals on the amplifier.

3) If connections are made as in 2) and it is desired to record, do not on any account set the INPUT SELECTOR of the amplifier to "DIGITAL".

■ CONCERNING THE REMOTE CONTROL

This unit has two systems for remote control operation, using the infra-red remote sensor or the 8-pin parallel input terminals.

Remote Control Transmitter

Battery installation

Insert the batteries with using two AAA, IEC R03, UM-4 (1.5 V) or equivalent batteries in the correct polarities (+, –).

To remove the batteries, push down the (–) side.

Notes:
- Do not mix old and new batteries, or batteries of different types (manganese and alkaline, etc.).
- Never subject batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote control is not to be used for a long period of time, remove the batteries and store them in a cool, dark place.
- Do not attempt to recharge alkaline or manganese batteries.

Battery life:

The battery life is about one year. The batteries should be replaced if commands from the remote control transmitter do not operate the unit even when the transmitter is held close to the front panel.

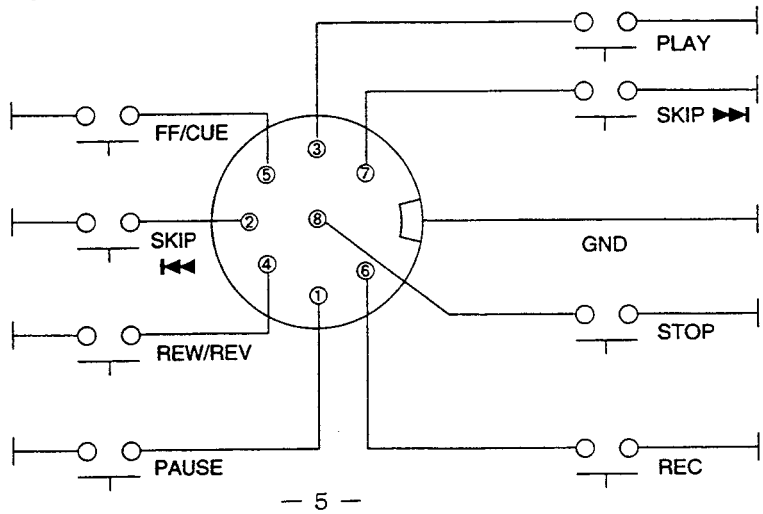
Correct method of use

1 Aim the remote control's transmission window toward the unit's sensor. Avoid any obstacles.
2 Use the remote control within a 60-degree angle of the unit.
The maximum distance is within 7 meters (23 feet) directly facing toward the unit.

Notes:
- Be sure the transmission window and the unit's sensor are free from dust. Excessive dust might affect its performance.
- The operation may not be correct if direct sunlight or other strong light source strikes the receiving sensor of this unit. If there is a problem, place the unit away from the light source.
- If this unit is installed in a rack with glass doors, the glass doors' thickness or color might make it necessary to use the remote control a shorter distance from the unit.

8-Pin Parallel Input Terminals

By connecting the following circuits, the SV-3800 can be operated by remote control using normal switches.



8-Pin Remote Specifications

8-pin remote key code:

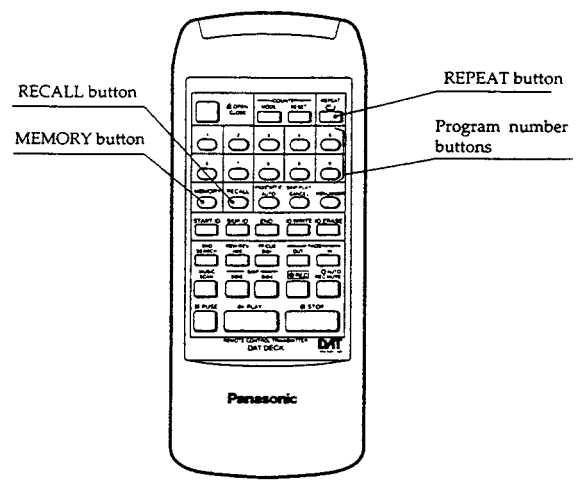
Note: The time taken until the key code for operating multiple commands must be less than 1 ms, and each code input must be more than 60 ms.

Function	8-pin DIN jack key	Function	8-pin DIN jack key
	Code No. 87654321		Code No. 87654321
open	00000001	memory	01000000
music scan	00011000	recall	01000001
skip cancel	00110000	repeat	01100001
stop	01111111		
play	11111011	write_start-ID	01010000
write	01101001	write_skip-ID	01010001
		erase_start-ID	01110000
auto rec mute	00100000	erase_skip-ID	01110001
rec	11011111		
pause	11111110	rec+play	11011011
forward skip	10111111	direct rec_pause	00011001
reverse skip	11111101	direct rec_play	00111000
		unload	00111001
counter mode	00101000	mode+reset+pause	10110000
auto PNO	00110001		
fade in	00100001	skip cancel on	00000010
fade out	00001000	skip cancel off	00000011
ff	11101111	auto PNO on	00100010
rew	11110111	auto PNO off	00100011
renumber	00010001		
counter reset	00001001		
end-ID	01101000		
skip-ID	01001001		
start-ID	01001000		
end search	01100000		
erase	00010000		
0 (key pad)	11000001		
1 (key pad)	10000000		
2 (key pad)	10000001		
3 (key pad)	10100000		
4 (key pad)	10100001		
5 (key pad)	10001000		
6 (key pad)	10001001		
7 (key pad)	10101000		
8 (key pad)	10101001		
9 (key pad)	11000000		

0: The connection is shorted.
1: The connection is open.

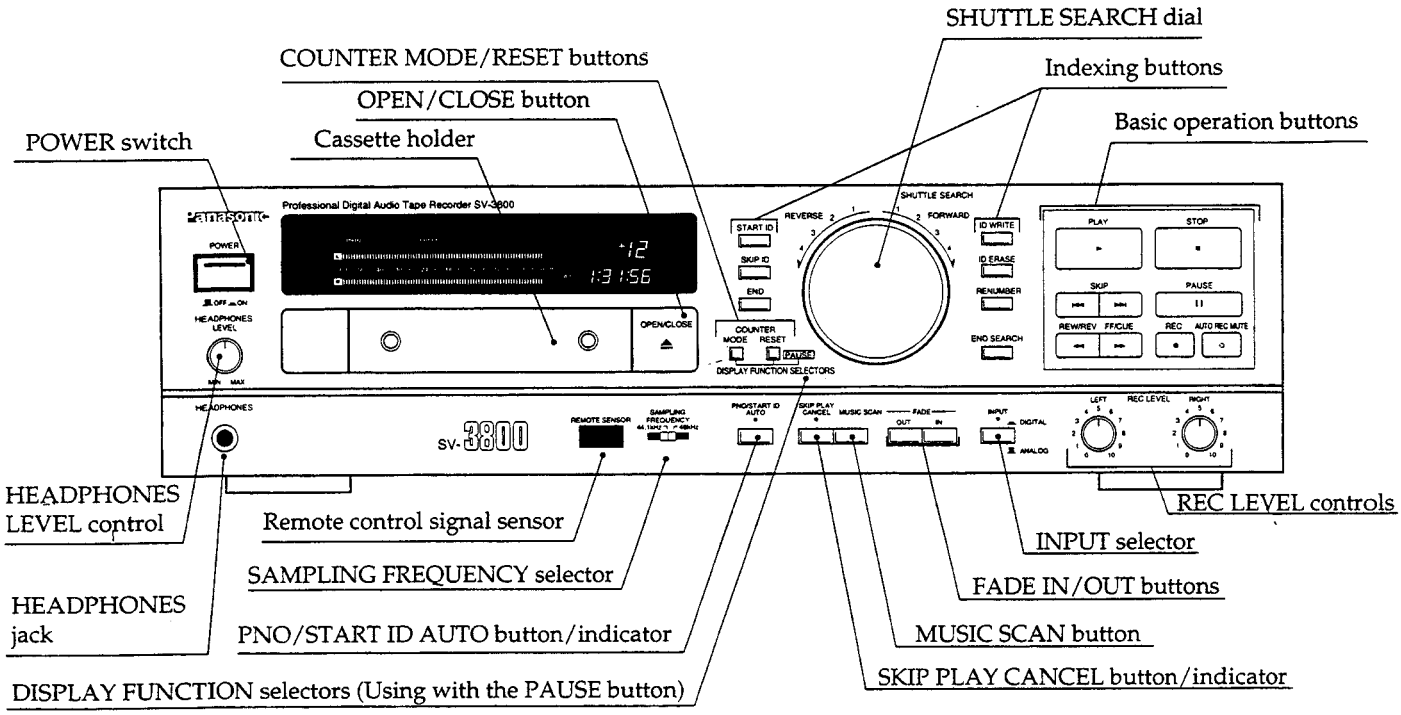
■ LOCATION OF CONTROLS

Remote Control Transmitter

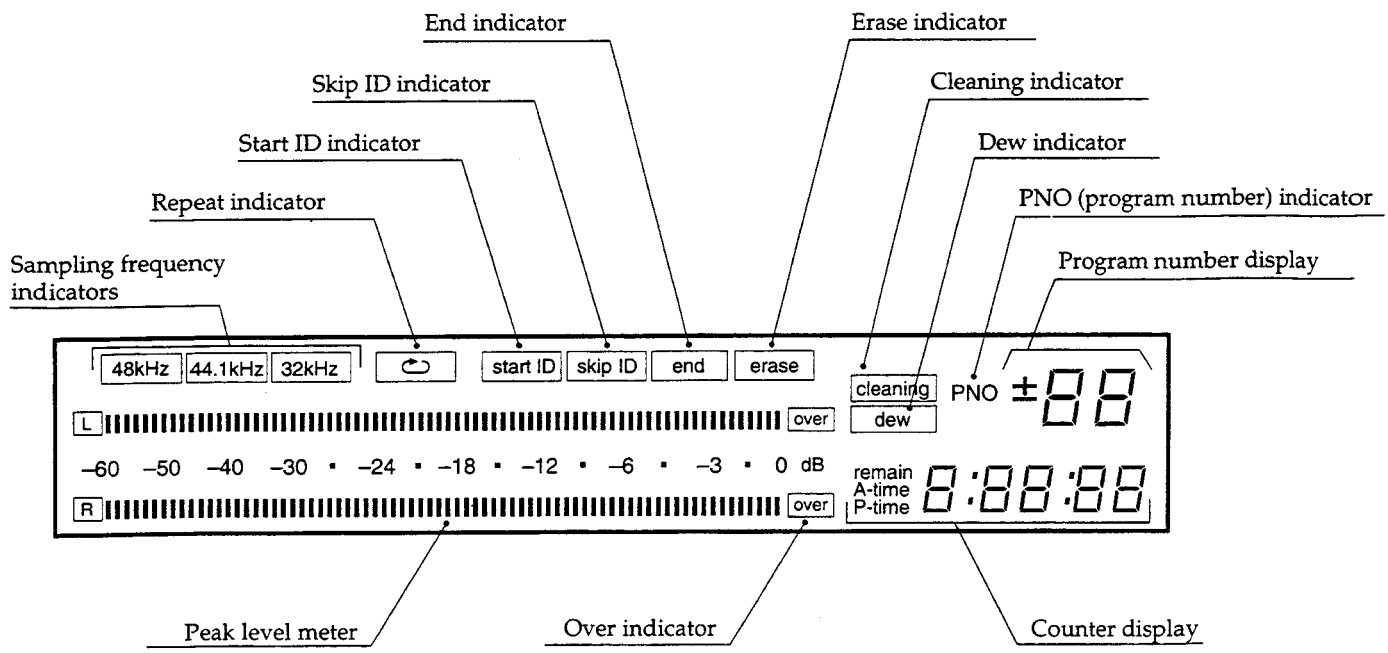


Unexplained buttons on the remote control transmitter function identically to their corresponding parts on the SV-3800.

Front Panel



Display Panel



■SV-3800 DAT MAINTENANCE CHART

• REGULAR MAINTENANCE

The purpose of periodic maintenance as recommended is to keep the equipment in the best possible operating condition throughout its useful life. Observance of this maintenance schedule ensures that maximum performance and reliability is obtained from the machine.

Regular maintenance is necessary because the DAT Recorder is a high-technology piece of equipment, containing DC motors, head cylinder assemblies, and a complex mechanism. These components deteriorate over time. Dust and dirt can clog the head gap, which affects the sound. In light of this, it is very important that overall maintenance be performed according to the maintenance chart to avoid problems resulting from heavy image. Maintenance should also be performed after any repairs on the equipment.

Maintenance is particularly recommended for DAT Recorders used in commercial and broadcast applications for serveral reasons. Installation and application are frequently under less than ideal conditions, such as long usage times and poor environmental conditions. All of this adversely affects the life span and performance of the machine. Regular maintenance assures that the purchaser obtains maximum value for this expenditure.

Note: Refer to the hour meter to know when to perform the maintenance.

Part Name	Part Number	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Upper Cylinder	VEH0460	○	●	○	●	○	●	○	●	○	●
Cylinder Unit	VEG0752	○	○	○	○	○	○	○	○	○	●
S. Load Arm Ass'y	RXL0052										●
T. Load Arm Ass'y	RXL0054										●
Load Cam	RDK0006-1						●				
Capstan Unit	REM0001	○	○	○	○	○	○	○	○	○	●
Post Roller	RXP0008	○	○	○	○	○	○	○	○	○	●
Guide Roller	RXP0027	○	○	○	○	○	○	○	○	○	●
Pinch Roller	1NB0001ZA	○	○	○	○	○	●	○	○	○	○
S. Reel Ass'y	RXR0006										●
T. Reel Ass'y	RXR0007										●
BT Lever	RXL0048										●
Tension Band Ass'y	RXL0036						●				
S. Brake Ass'y	RXL0049						●				
T. Brake Ass'y	RXL0050						●				
Idler Gear	RDG0071										●
Mode Motor Ass'y	REM0009								●		
Mode Cam	RDK0007-1										●
M Gear B	RDG0067										●
Drive Gear Ass'y	RXG0011						●				
Idler Gear (F)	RDG0069										●
Idler Gear (P)	RDG0068										●
Mode SW Ass'y	RES0002						●				
Load SW Ass'y	RES0001										●
Cassette SW	EVQWR4002										●
Earth Terminal	RUS740ZA										●
Loading Motor	MMN-6FBRC8S										●
Belt	SMQ20025										●
Leaf SW	SSPD18										●

● Replacement, ○ Cleaning

• DAT Head and Tape Transport Cleaning

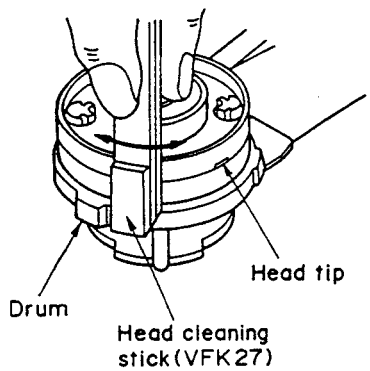
Through normal usage of any tape machine, dirt and debris from the tape accumlates on the heads, which eventually causes performance problems. By using a cleaning cassette regularly, dirt buildup can be minimized, prolonging the life of the tape heads, and also keeping tape posts, tape guides, and the pinch roller clean.

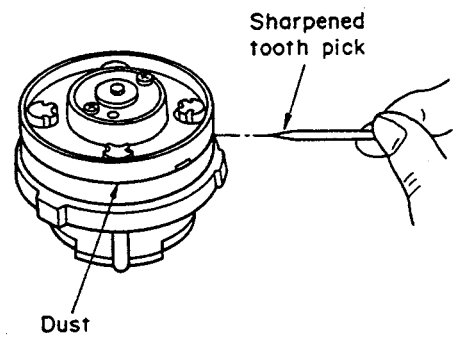
• CLEANING

1. Play the cleaning cassette (Panasonic Part No. RT-RCLP) for 15-20 seconds.
2. Do not use the same part of the cleaning tape more than once.
3. Clean all tape contact surface, including A/C head upper and lower drum, thoroughly with a soft cloth soaked in alcohol.
4. Clean both heads by gently rubbing in a horizontal direction, as depicted, using a head cleaning stick (VFK27) or a lint free cloth moistened with alcohol.
5. Wipe all tape contact surfaces, including upper and lower drum, with a dry soft cloth to ensure that all residual moisture is removed from the tape contact surfaces.

Note:

1. When cleaning the upper drum, hold it secure with your finger tips.
2. Occasionally, dirt or debris may become lodged in the air bearing channels that are cut in the upper drum's surface. This can be removed by gently dislodging it with a sharpened toothpick.
3. Modest amounts of solvent are used Excess alcohol will dilute and remove the bearing lubricant in the capstan motor and rotary guides.



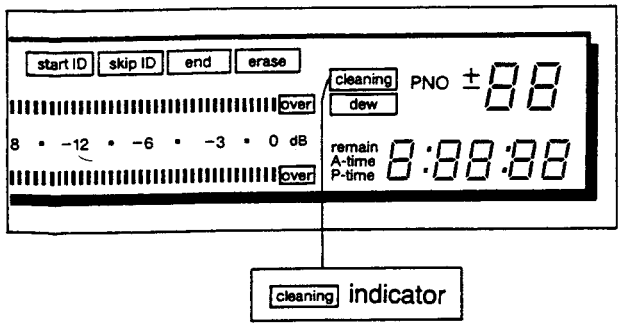


• IMPORTANCE

Check the Error Rates at several points in the tape and average the values. If the Error Rates in creases to around 300, a Panasonic Head Cleaning Tape can be used as follows: Play the cleaing tape throgh the SV-3800 for approximately 15~20 seconds, and remove it.
DO NOT REWIND the cleaing tape, since this action might very well spread previously removed dirt and dust onto an otherwise clean head and transport. After the Head Cleaning Tape has been used up, dipose of it properly and start to use a new one.

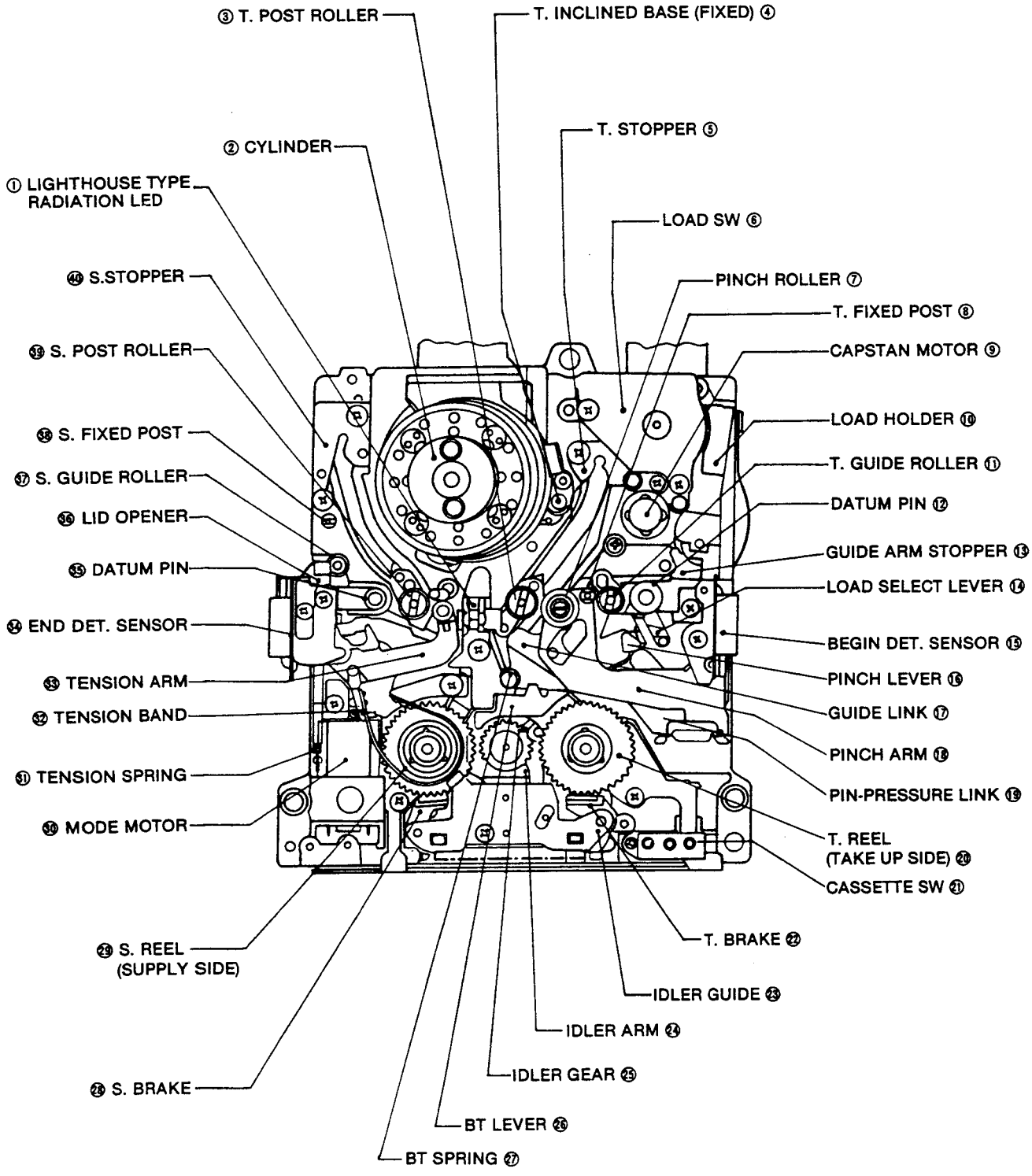
If the DAT heads become very contaminated with dirt and dust, the CLEANING indicator within the display panel will flash. In this case, use a Head Cleaning Tape as described above.

- If playback quality improves after cleaning, but then desteriorates immediately after recording or playing back several times, the cassette tape has probably reached its useful lifetime. In this case, use a new tape.
- If sound quality does not improve even after cleaning, consult your dealer.
- Cleaning tapes cannot be used for recording or playback (be sure to read also the operating instructions supplied with the tape).

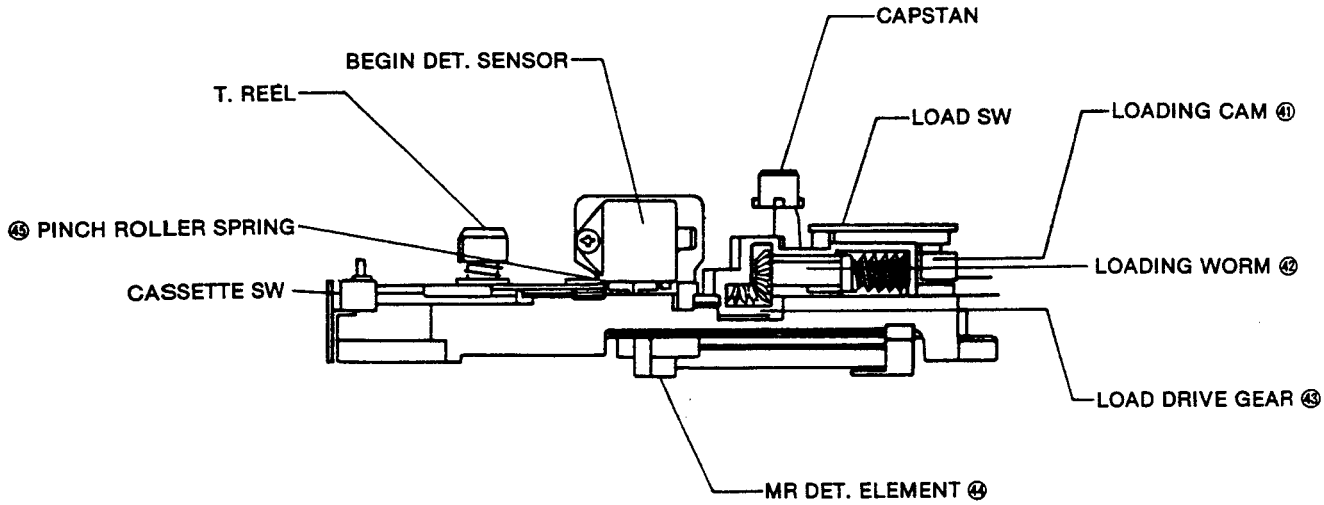


• MECHANISM COMPONENT LAYOUT

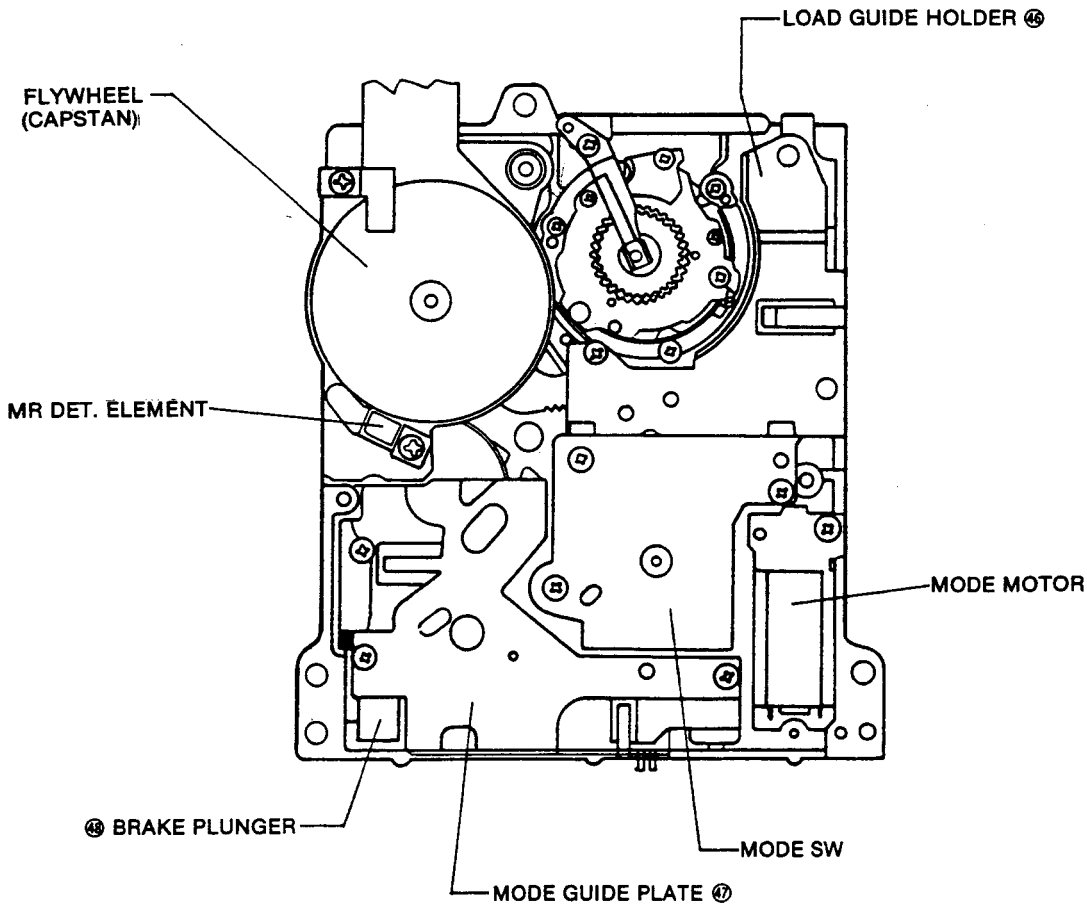
• Top view



• **Side view**



• **Bottom view**



• MECHANISM CONTROLS AND FUNCTIONS

① LIGHT HOUSE TYPE RADIATION LED	Lighthouse-shaped, LEDs blink at start and end of tape.
② CYLINDER	30mm in diameter, 40 FG pulses, maintains specified speed of 1000 to 3000rpm.
③ T. POST ROLLER	Regulates tape travel position (upper edge).
④ T. INCLINED BASE (FIXED)	Regulates angle (90°) at which tape is wound around cylinder (stationary).
⑤ T. STOPPER	Determines position of T post roller base during loading.
⑥ LOAD SW	Two-bit rotary switch, detects loading position.
⑦ PINCH ROLLER	Presses against tape during play and review.
⑧ T. FIXED POST	Regulates tape travel position.
⑨ CAPSTAN MOTOR	1.5mm in diameter, 290 FG pulses.
⑩ LOAD HOLDER	Contains loading drive gear and worm gear, engages and disengages M gear A.
⑪ T. GUIDE ROLLER	Regulates tape travel position (top edge).
⑫ DATUM PIN	Regulates width and height (right side) during loading of cassette tape.
⑬ GUIDE ARM STOPPER	Determines position of T guide roller base K during loading.
⑭ LOAD SELECT LEVER	Switches engagement and disengagement of loading gear in accordance with loading conditions.
⑮ BEGIN DET. SENSOR	Light-receiving element for LED (detection at start of tape).
⑯ PINCH LEVER	Presses pinch roller against tape during play and review.
⑰ GUIDE LINK	Links T post roller base and guide roller base.
⑱ PINCH ARM	Comprised of pinch roller and T holding post, presses against the capstan.
⑲ PIN-PRESSURE LINK	Connected by the pin pressure spring and the pinch arm.
⑳ T. REEL (TAKE UP SIDE)	Take-up reel base, 64 FG pulses.
㉑ CASSETTE SW	Detects cassette information (mistaken erasure, cassette detection).
㉒ T. BRAKE	Presses brake gear against reel base gear to perform braking.
㉓ IDLER GUIDE	Holding cover for idler arm and S and T brakes.
㉔ IDLER ARM	Moves left or right in accordance with mode condition, transmits movement of counter gear to S and T reels.
㉕ IDLER GEAR	Transmits movement to S and T reels in accordance with mode.
㉖ BT LEVER	Applies back tension to T reel during review.
㉗ BT SPRING	Provides pressure for back tension lever.
㉘ S. BRAKE	Presses brake shoe against S reel base gear to perform braking.
㉙ S. REEL (SUPPLY SIDE)	Supply reel base, 64 FG pulses.
㉚ MODE MOTOR	6.5V DC motor, switches mode by forward and reverse revolution.
㉛ TENSION SPRING	Provides back tension force of tension regulator.
㉜ TENSION BAND	Mounted to tension regulator, applies back tension to S reel base.
㉝ TENSION ARM	Detects tape condition and applies back tension during play and review.
㉞ END DET. SENSOR	Light-receiving element for LED (detection at end of tape).
㉟ DATUM PIN	Regulates width and height (left side) during loading of cassette tape.
㊱ LID OPENER	Opens cassette lid during loading of tape.
㊲ S. GUIDE ROLLER	Regulates tape travel position (bottom edge).
㊳ S. FIXED POST	Regulates tape travel (bottom edge).
㊴ S. POST ROLLER	Regulates tape travel position (top edge).
㊵ S. STOPPER	Determines position of S post roller base during loading.
㊶ LOADING CAM	Uses movement transmitted from loading worm to move loading lever.
㊷ LOADING WORM	Transmits movement of loading drive gear and loading cam.
㊸ LOAD DRIVE GEAR	Transmits movement of M gear A and loading worm, engages and disengages in accordance with mode.
㊹ MR DET. ELEMENT	Detects magnetic changes (290 pulses) of flywheel.
㊺ PINCH ROLLER SPRING	Mounted to the pinch arm, returns the pinch roller.
㊻ LOAD GUIDE HOLDER	Holding cover of the loading arm and loading lever.
㊼ MODE GUIDE PLATE	Holding cover of the various gears, holds the plunger in position.
㊽ BRAKE PLUNGER	5V, 200mA, switches brakes on and off in accordance with the mode.

■ OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES

NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.

• Contents

•Checking Procedure for each P.C.B. page.

1. Checking for the operation P.C.B. and headphones jack P.C.B. ····· 13.
2. Checking for the digital P.C.B. and main P.C.B. ····· 14.
3. Checking for the servo P.C.B. ····· 15.
4. Checking for the RF P.C.B. ····· 15,16.

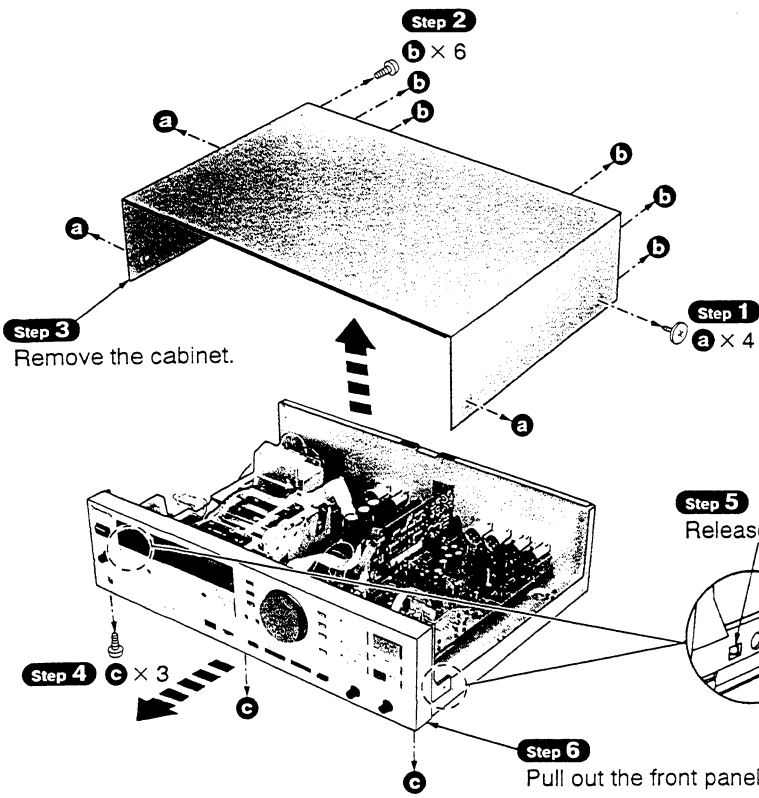
•Main Component Replacement Procedures

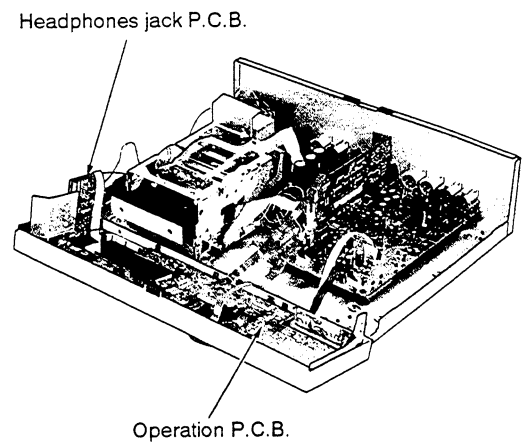
1. Replacement for the regulator IC ····· 17.
2. Replacement for the upper cylinder ····· 17,18.
3. Replacement for the belt and motor ass'y ····· 18.

■ Checking Procedure for each P.C.B.

1. Checking for the operation P.C.B. and headphones jack P.C.B.

• Check the operation P.C.B. and headphones jack P.C.B. as shown below.

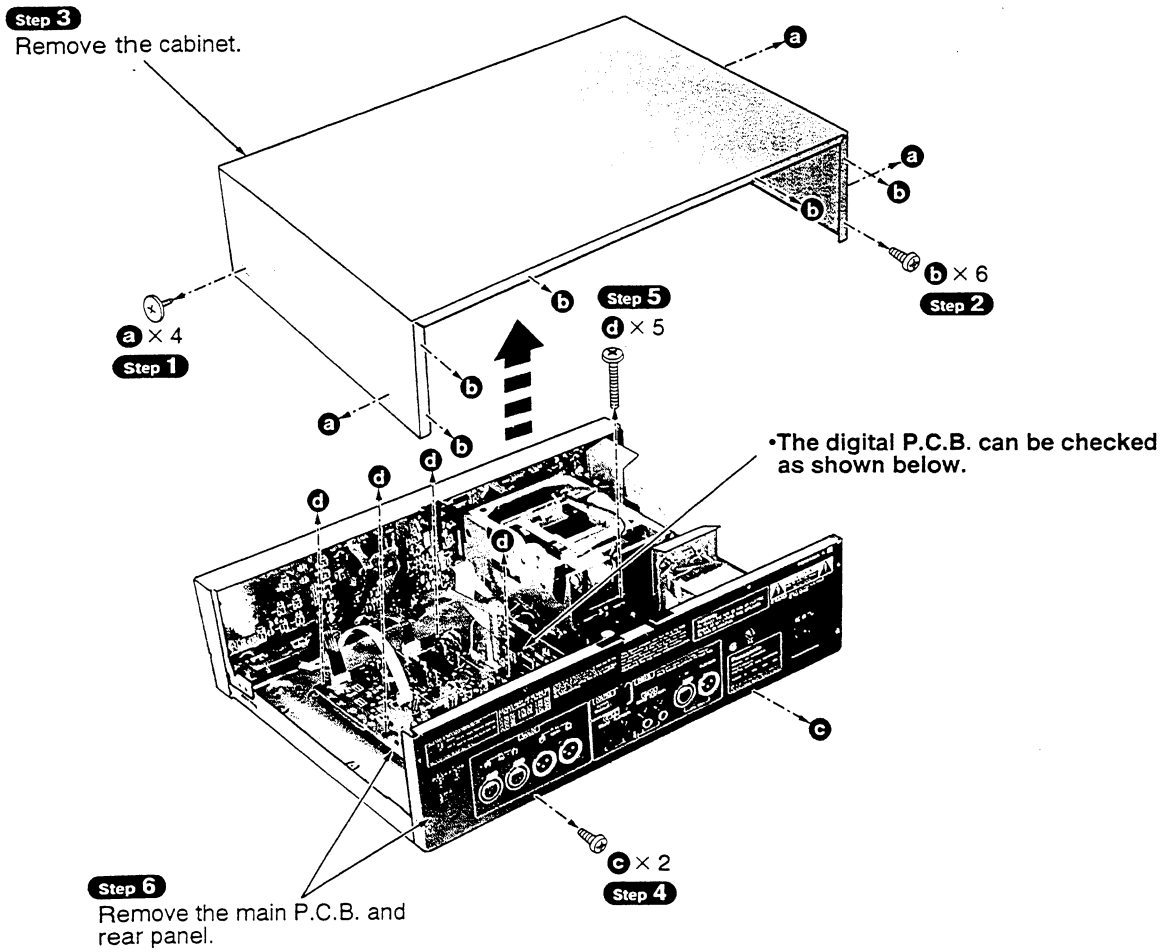




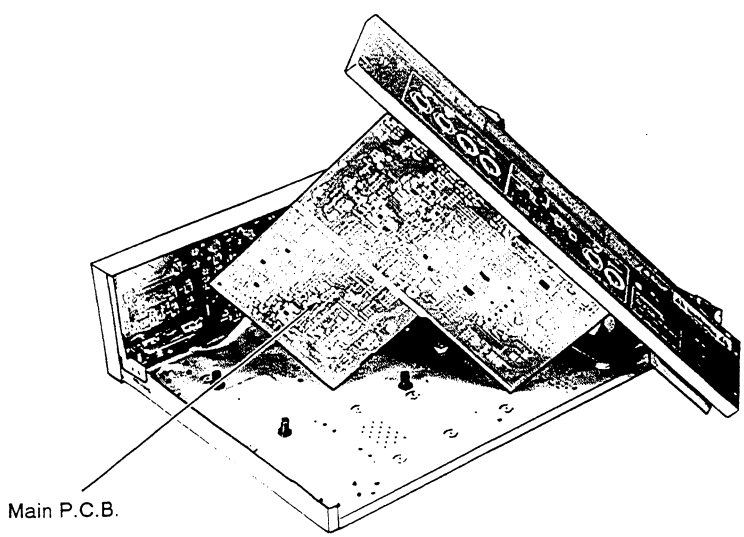
ⓐ (Black)
[SNE2095-5]

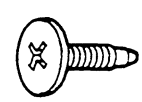
ⓑ, ⓒ (Black)
[XTBS3+8JFZ1]

2. Checking for the digital P.C.B. and main P.C.B.

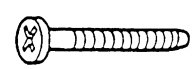


• **Check the main P.C.B. as shown below.**




[SNE2095–5] (Black)

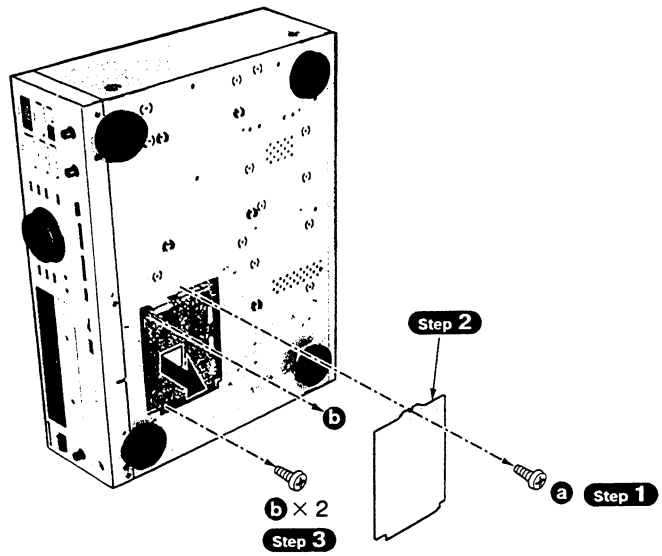
[XTBS3+8JFZ1] (Black)


[XTB3+20JFR] (Red)

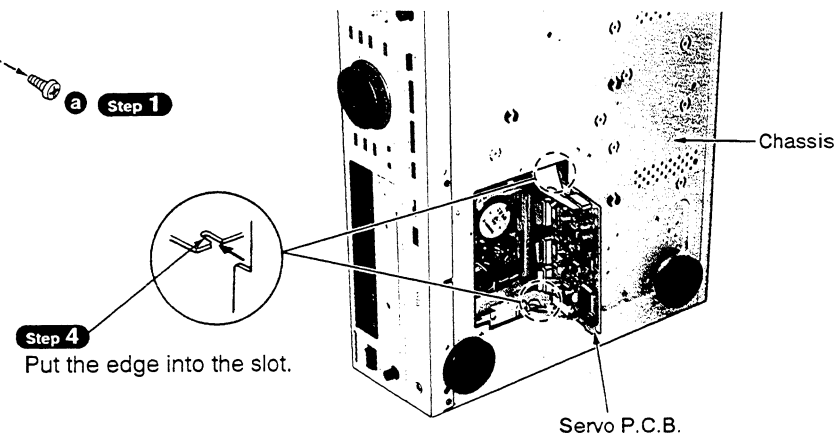
3. Checking for the servo P.C.B.

ⓐ (Black) [XTBS3+8JFZ1]

ⓑ (Black) [XTB3+6J]

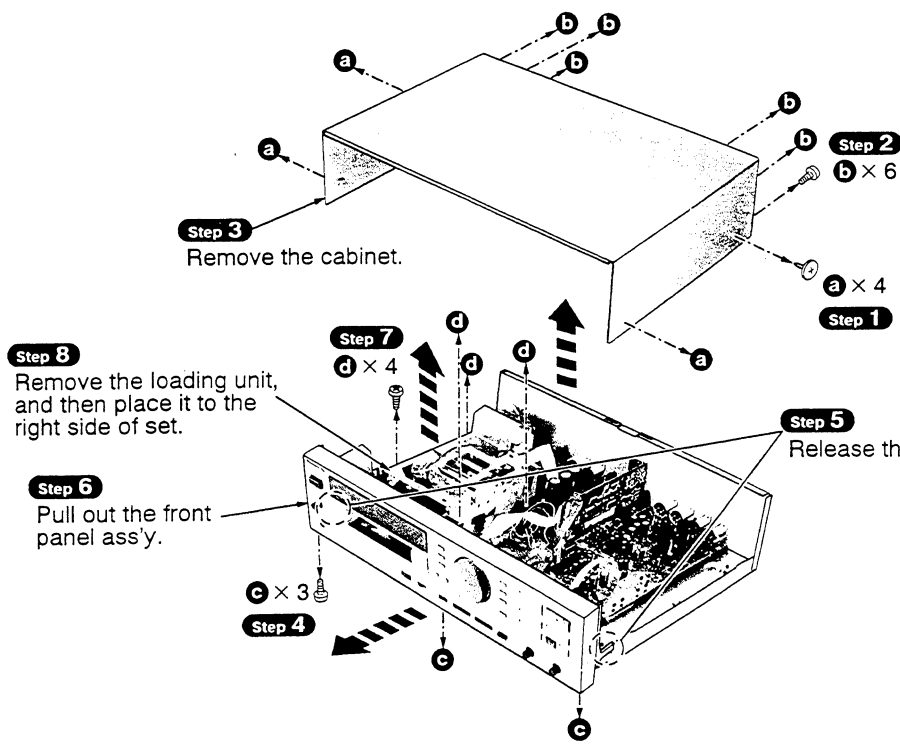


NOTE
Take care not to short circuit the servo P.C.B. with chassis.



• **Check the servo P.C.B. as shown above.**

4. Checking for the RF P.C.B.

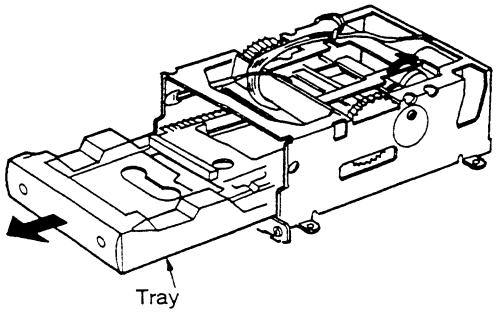


ⓐ [SNE2095-5]

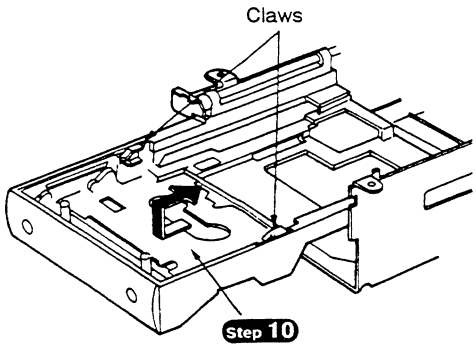
ⓑ, ⓒ [XTBS3+8JFZ1] (Black)

ⓓ [XTB3+6F]

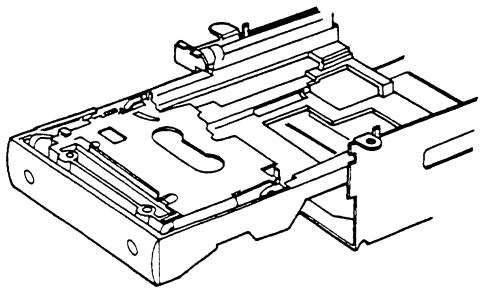
Step 9 Rotate the pulley gear, and then move the tray forward.



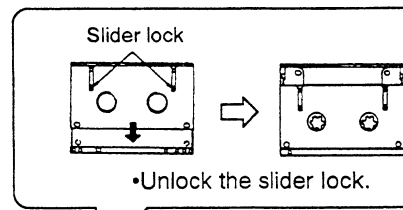
(Upset)



Step 10 Put the slider cassette holder angle on the claws.

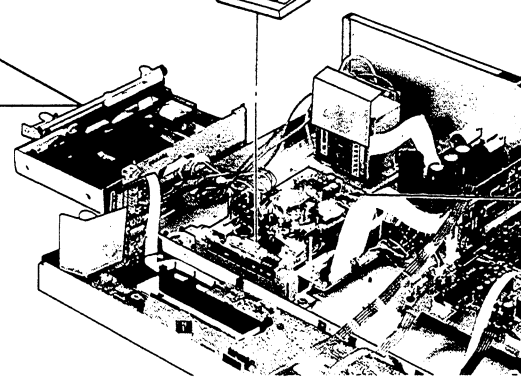


Caution: The slider cassette holder angle will be deformed if it is left as is.

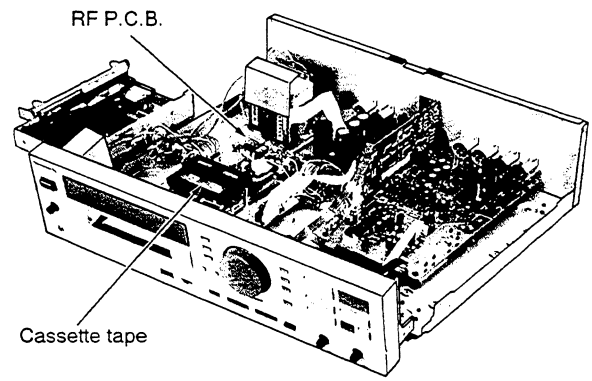


•Unlock the slider lock.

Step 11 Place the cassette tape.



•Check and adjust the RF P.C.B. as shown below.



• Fix the cassette tape with adhesive tape.

Notice for reassembling the loading unit

Step 3 ⓐ Fix with screws, and then put the tray fully.

More than 50mm

Step 2 Install the loading unit to the mechanism frame.

Step 1 Draw the tray forward more than 50mm.

Mechanism frame

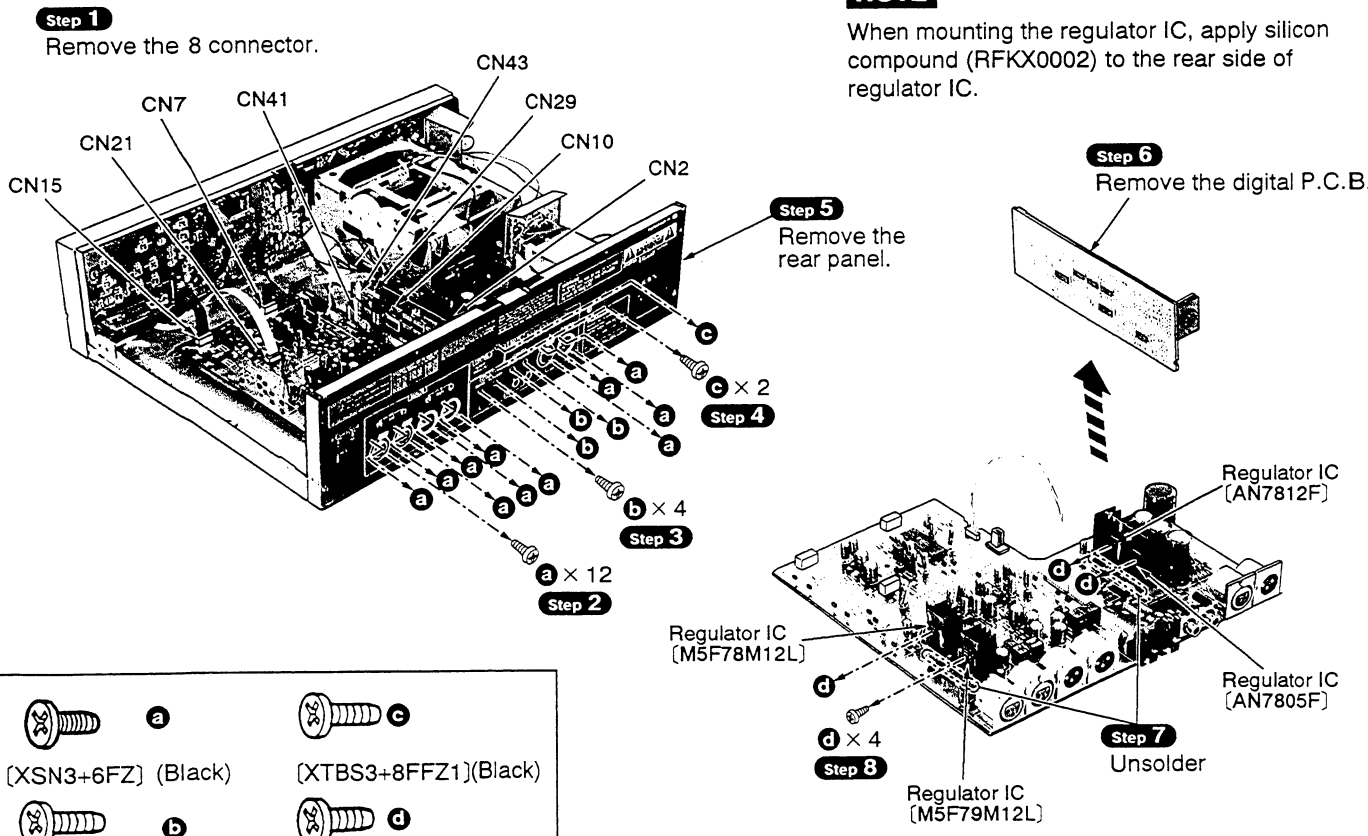
ⓐ [XTB3+6F]

■ Main Component Replacement Procedures

1. Replacement for the regulator IC

•Follow Step 1 ~ Step 5 in item 2 on checking procedure for each P.C.B..

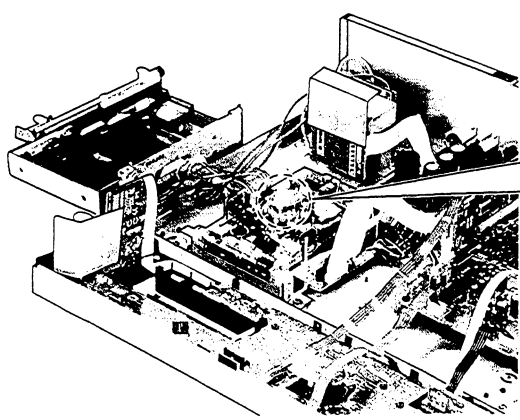
NOTE
When mounting the regulator IC, apply silicon compound (RFKX0002) to the rear side of regulator IC.



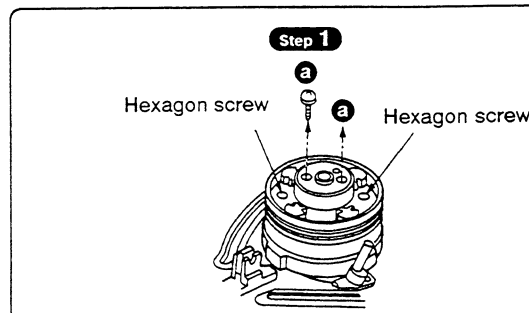
a [XSN3+6FZ] (Black)
c [XTBS3+8FFZ1](Black)
b [XTBS3+8JFZ1] (Black)
d [XTB3+8J]

2. Replacement for the upper cylinder

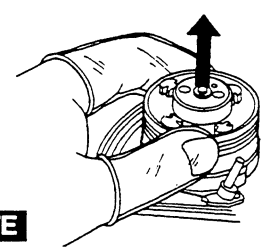
•Follow Step 1 ~ Step 8 in item 4 on checking procedure for each P.C.B..



a [VHD0593]



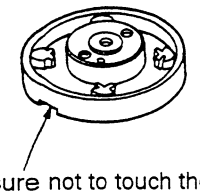
NOTE Please do not touch hexagon screws.



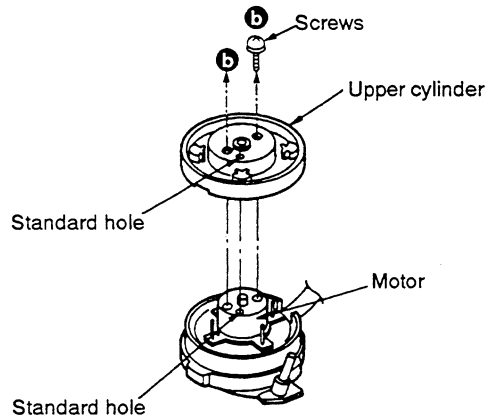
Step 2
Pull out the upper cylinder. [VEH0460]

NOTE
Do not touch the cylinder (head) with your bare hand; always be sure to wear a glove or other protection.

Notice for installing the Upper cylinder



NOTE Be sure not to touch the head part.



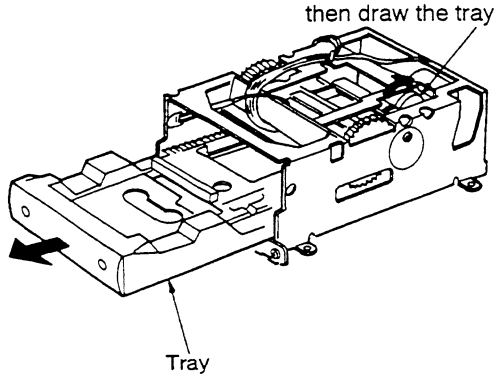
•Mount the upper cylinder matching the motor's standard hole with the cylinder.

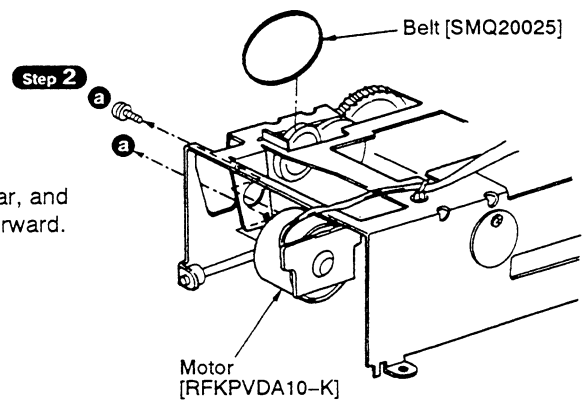
b
[VHD0593]

3. Replacement for the belt and motor ass'y

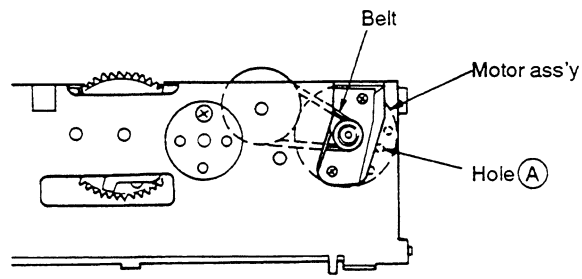
•Follow Step 1 ~ Step 8 in item 4 on checking procedure for each P.C.B..

Step 1
Rotate the pulley gear, and then draw the tray forward.





■ Installing the motor ass'y



•Install the motor ass'y so that the hole Ⓐ is located as shown above.

a
[XYN26+C33]

■ MEASUREMENTS AND ADJUSTMENTS

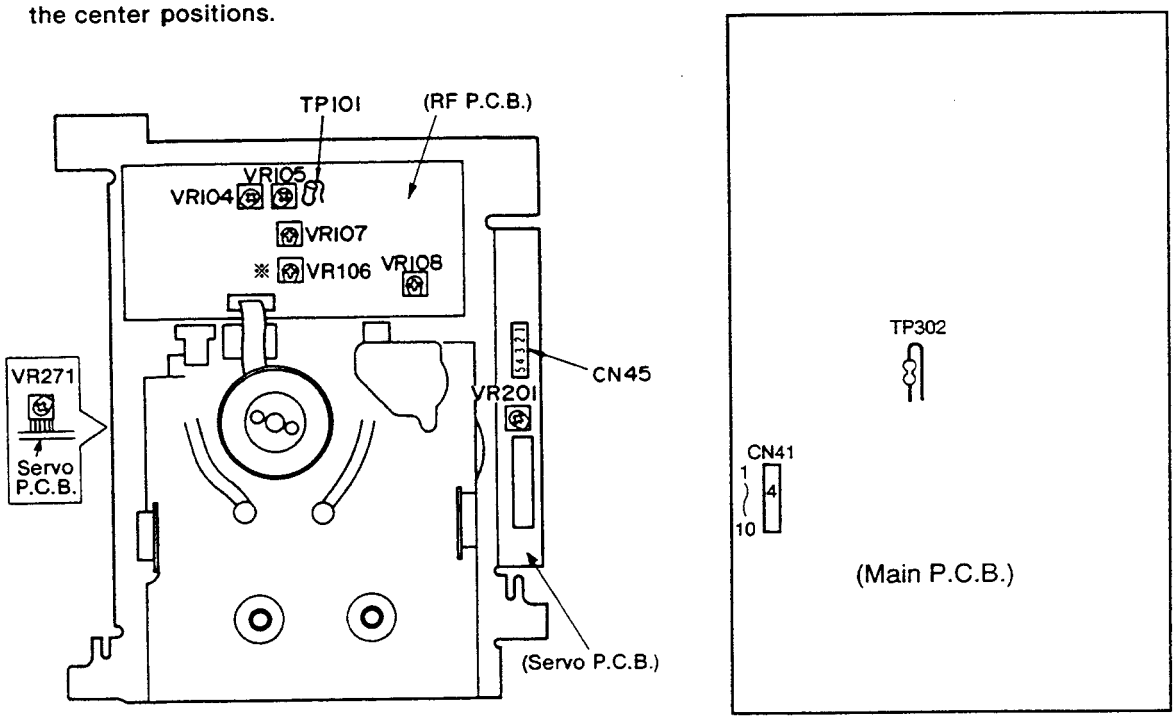
• PREPARATION

Refer to the "4. Checking for the RF P.C.B." of operation check and main component replacement procedure on page 15.

• ELECTRICAL ADJUSTMENT

• Adjustment points

※ VR106 do not require adjustment; if the VR is replaced or require readjustment, set the dial to the center positions.



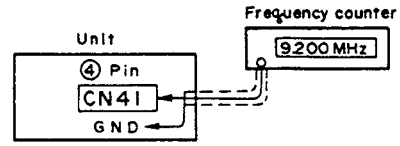
Equipment and Tools

- 2-channel 30MHz oscilloscope with external trigger and dual time base
- 2 oscilloscope probes (10 : 1)*
- Frequency counter
- AF oscillator (OSC)
- Distortion analyser
- DC electronic voltmeter (EVM)
- Post roller adjustment screwdriver
  : SZZV1102C
- Standard test tapes
  : RD-PG01 (PG reference tape)
  : RD-ER01 (Error rate tape)
  : RD-LR02 (Linearity adjustment tape)
- Blank DAT cassette for recording and playback
  : RT-R60P, RT-R90P, RT-R120P
- Standard electrical tools and equipment

* **NOTE:** The oscilloscope voltage settings in the charts and the waveform examples assume use of the specified 10: 1 probes.

1. PLL Free Run Adjustment

1. Connect the frequency counter as shown in figure.
2. Set the power switch to "**ON**".
3. Open the cassette holder drawer.
4. Adjust **VR108** as required until the frequency counter reads **9.2±0.2MHz**.

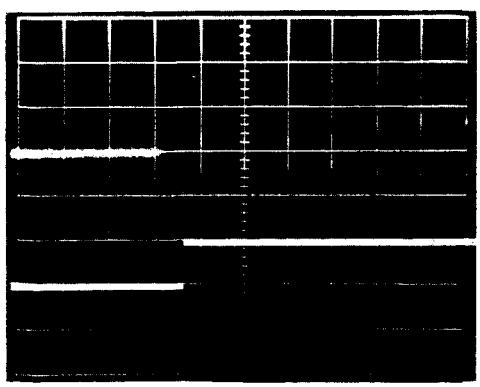


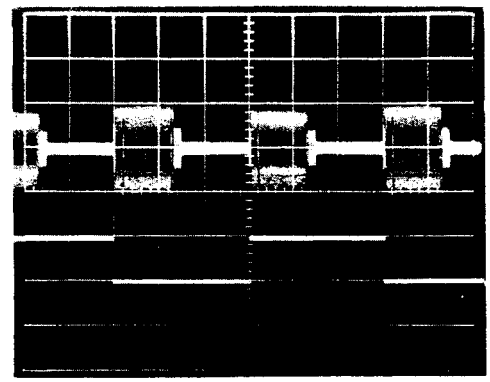
2. PG Phase Adjustment

1. Set up the oscilloscope and connect as shown below.

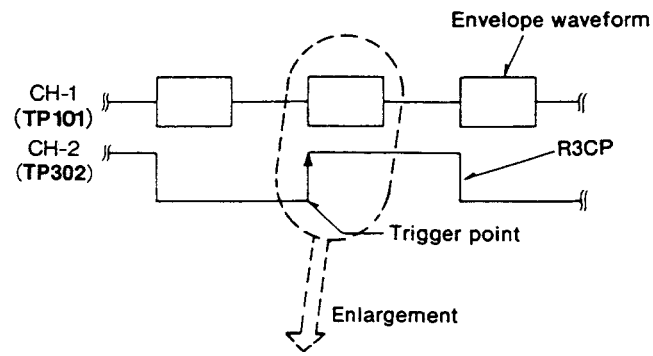
	CH-1	CH-2
Test point	**TP101 (RPRF)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay Time/Div.	50µsec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR201**	

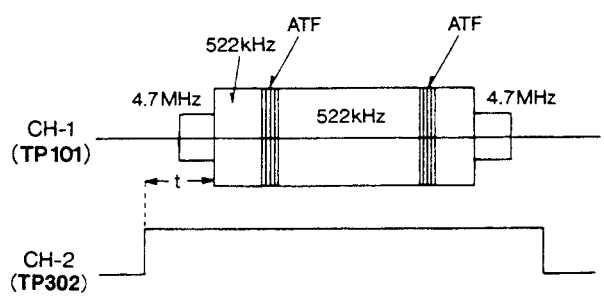
2. Note the "t" time indicated on the PG reference tape (RD-PG01), then load and play the tape.
3. While the tape is being played, the waveform shown on the right should appear.
4. Adjust the delay time for the dual time base to display the leading edge of the CH-2 (R3CP) waveform.
5. The time from the leading edge of R3CP to the leading edge of the **522kHz** portion of the RF wafeform must be within **±40µsec** of the time indicated on the PG reference tape. Adjust **VR201** as required, so that the time "t" (in the figure below), falls within specified limits.





Note:
If the output levels of heads A and B are not equal, the "ATF RF Recording Level Adjustment" described in procedure 4 might be made improperly.
Adjust the ATF RF Recording Level by following procedure 4 and then check the output level of the heads again. (At this time, it is not necessary to make adjustment dascribed in procedure 2.)





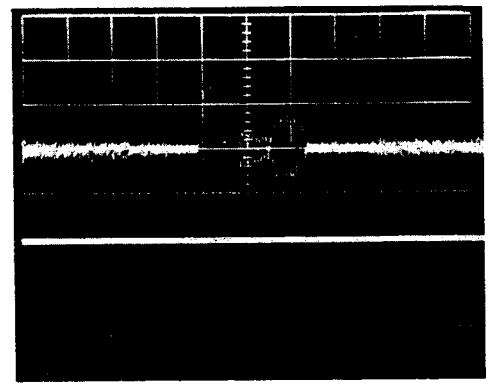
t: Value (µsec) indicated on the standard tape ±40µsec.

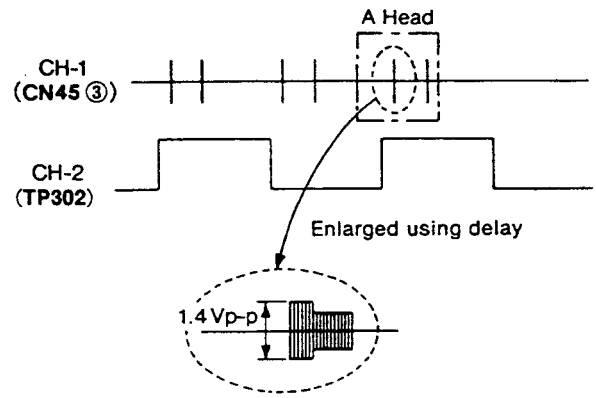
3. ATF Gain Adjustment

1. Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	0.1msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR107**	

2. Load and play the error rate tape (RD-ER01).
3. Adjust the delay time for the dual time base to select and display the PILOT signal with the largest amplitude.
4. Adjust **VR107** so that the amplitude of the PILOT signal is **1.4±0.2Vp-p**. Check the amplitudes of the other PILOT signals to insure that they are a minimum of **1.2Vp-p**. If not optimize the adjustment of **VR107** for the minimum signal level.





4. ATF RF Recording Level Adjustment

NOTE: This adjustment should only be made after confirming the playback "ATF Gain Adjustment" in step 3 above. Failing to do so will invalidate this adjustment.

1. Make a "0" level recording:
   (a) Load a blank tape (RT-R60P etc.) into the unit.
   (b) Put the unit into RECORD mode.
   (c) Run the tape, recording for a minimum of 20 to 30 seconds.
   (d) Rewind the tape to the beginning of the "0" level signal recording.
2. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	2msec.	
Delay Time/Div.	0.2msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR104**: Head A, **VR105**: Head B	

3. While playing back the blank signal portion of the tape, verify that the signal amplitude falls in the range of **1.4±0.2Vp-p**.

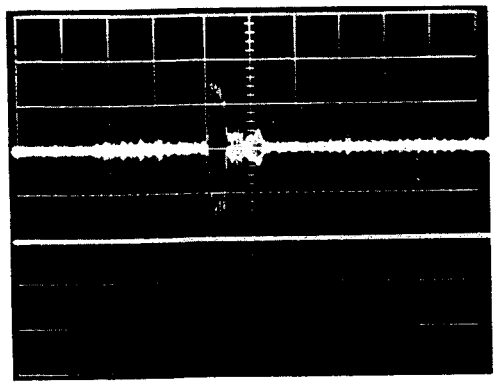
Standard value: 1.4±0.2Vp-p

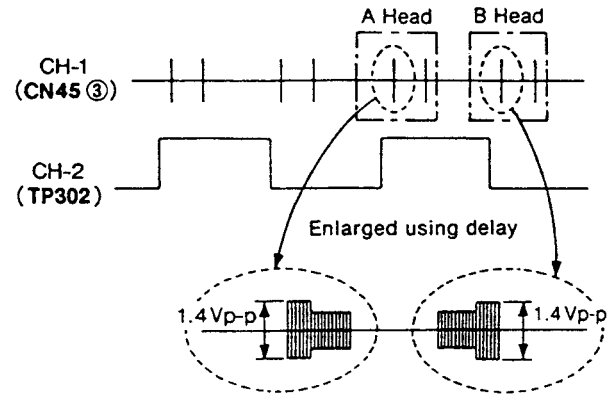
4. If the ATF signal is not within specification press the stop button and adjust **VR104** and **VR105** accordingly. Making finer adjustments as the trials approach the specified level.

LEVEL/HEAD	A: **VR104**	B: **VR105**
More than 1.6V	Turn ↺	Turn ↺
Less than 1.4V	Turn ↻	Turn ↻

After making the adjustment, make another blank signal recording, on a different portion of the tape (use the END SEARCH feature), for 20 to 30 seconds. Rewind the tape to the beginning of the new recording and repeat from step 3 until the specification is met.

Note:
It is necessary to use a different portion of the tape for each trial because DAT does not erase the original signal, it "over writes" the new signal. Using a new portion of the tape will prevent maladjustment due to incomplete "over write" of the previously recorded signal.





5. BOT/EOT Detection Sensitivity Verification and Adjustment

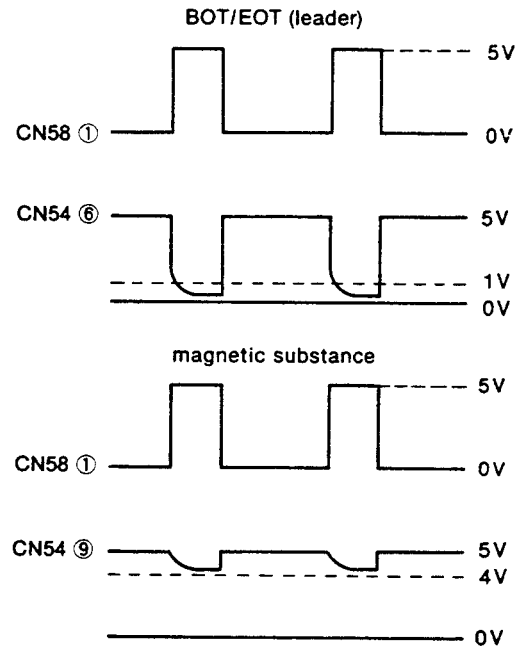
1. Make sure that the tape stops with the leader portion (the beginning and ending portion).

※ If the tape does not stop at the leader, make adjustment by following procedure outlined below.

① Insert a blank tape into the tape compartment of the set and press the playback button at the end of the tape.

② Set up the oscilloscope and connect as shown below.

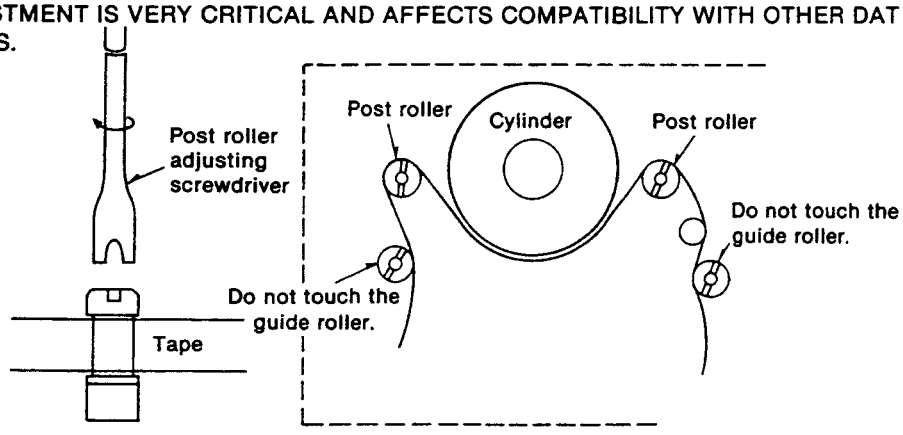
	CH-1	CH-2
Test point	**CN54** ⑥ (BOT/EOT) ⑨ (magnetic substance)	**CN58** ①
Volts/Div.	0.2V	0.2V
Time/Div.	2msec.	
Delay	—	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR271**	



③ Adjust the amplitude of waveform to less than **1V** at the magnetic substance and more than **4V** at the leader on **VR271**.

6. Linearity Adjustment

CAUTION: ONLY THE POST ROLLERS ARE USED FOR THE LINEARITY ADJUSTMENT. DO NOT ADJUST THE GUIDE ROLLERS.
THIS ADJUSTMENT IS VERY CRITICAL AND AFFECTS COMPATIBILITY WITH OTHER DAT RECORDERS.



1. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	0.2V	2.0V
Time/Div.	Ⓐ 5msec. Ⓑ 1msec. © 0.2msec.	
Delay Time/Div.	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**Post rollers (only)**	

2. Load and play the linearity adjustment tape (RD-LR02). Please use the recorded signal portion on tape (after 600 count from begining of tape)
3. Use the leading edge of the CH-2 (R3CP) waveform to trigger the oscilloscope to monitor the head "A" side of the RF signal envelope.
4. While the tape is playing, gradually adjust the height of the POST ROLLERS until the RF envelope (B) is rectangular.

CAUTION 1:
ADJUSTMENTS MUST BE MADE VERY GRADUALLY.

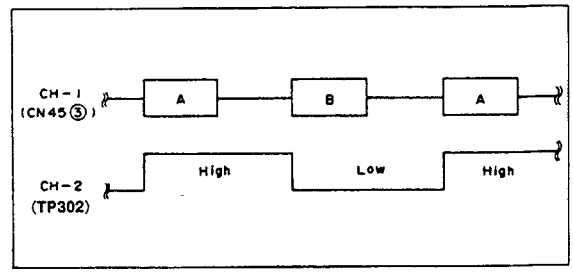
CAUTION 2:
DO NOT "OVER ADJUST" the POST ROLLERS. It is unlikely that the POST ROLLERS will require more than a QUARTER of a turn in either direction to make the waveform rectangular.

5. Adjust **VR107** so that the amplitude (V_0) of the PILOT waveform © is **1.0Vp-p**.

6. On the PILOT signal waveform ©, verify that the amplitude difference between adjacent tracks falls **within 200mV** (See figure below). If not, adjust the post rollers.

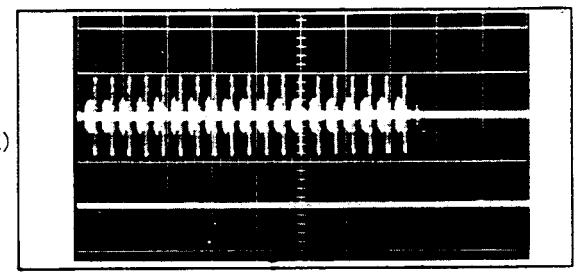
7. Play the standard test tape (RD-ER01), and do "PG Phase adjustment" and "ATF gain adjustment" again.

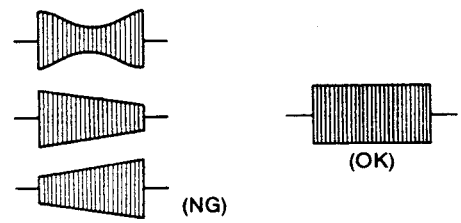
Ⓐ



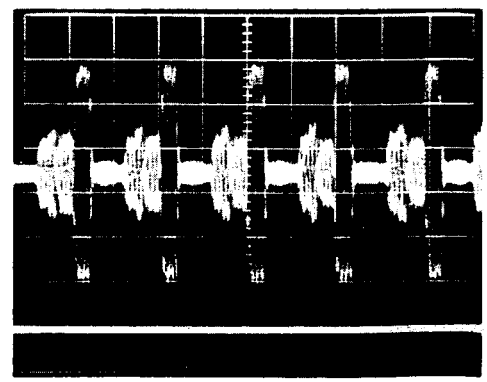
Ⓑ

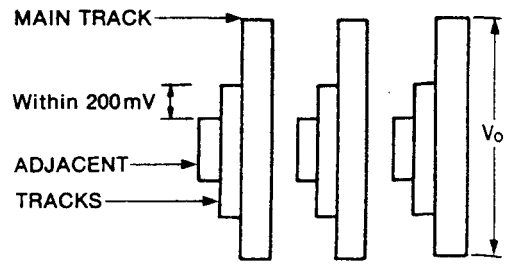
(OK)



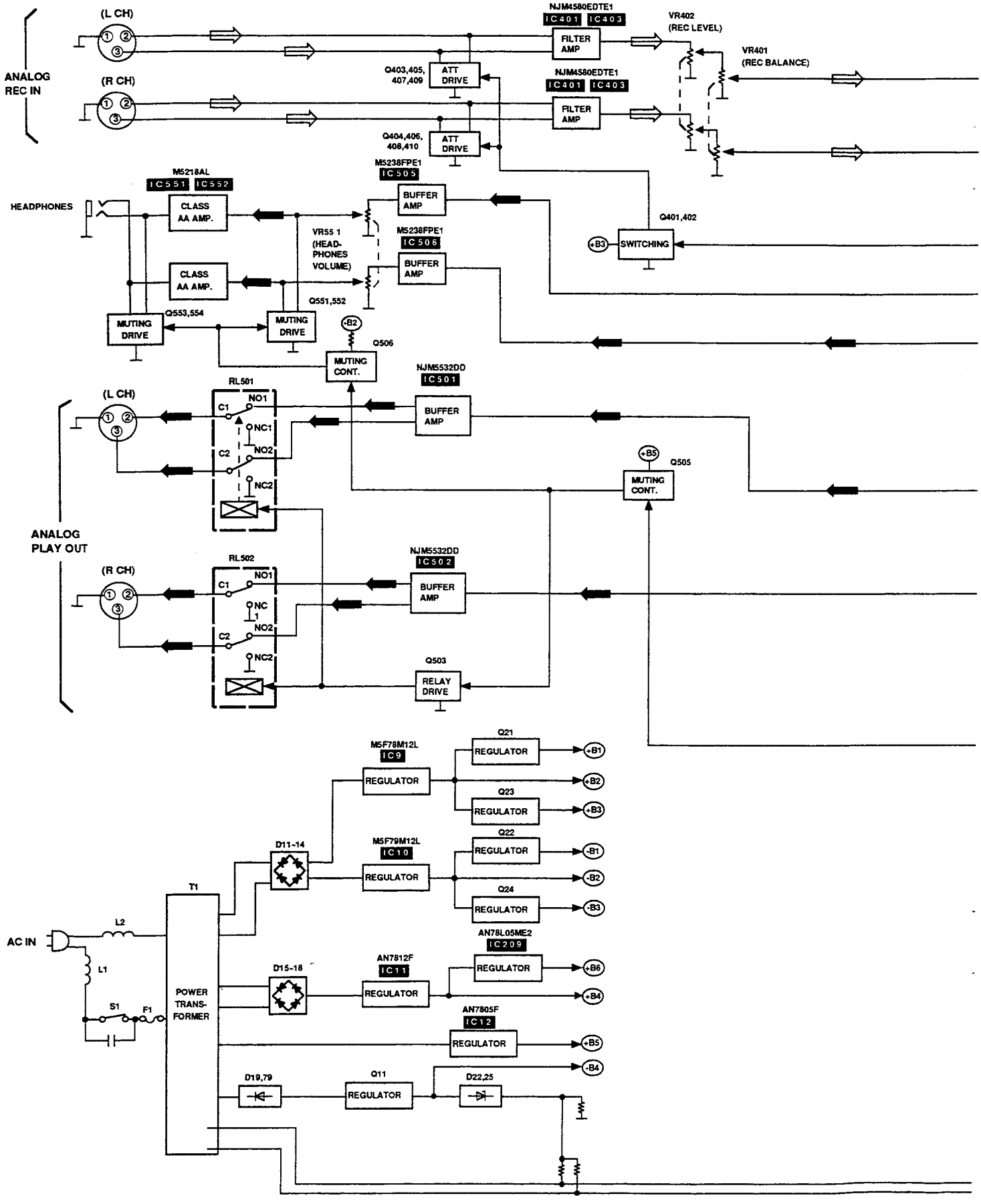


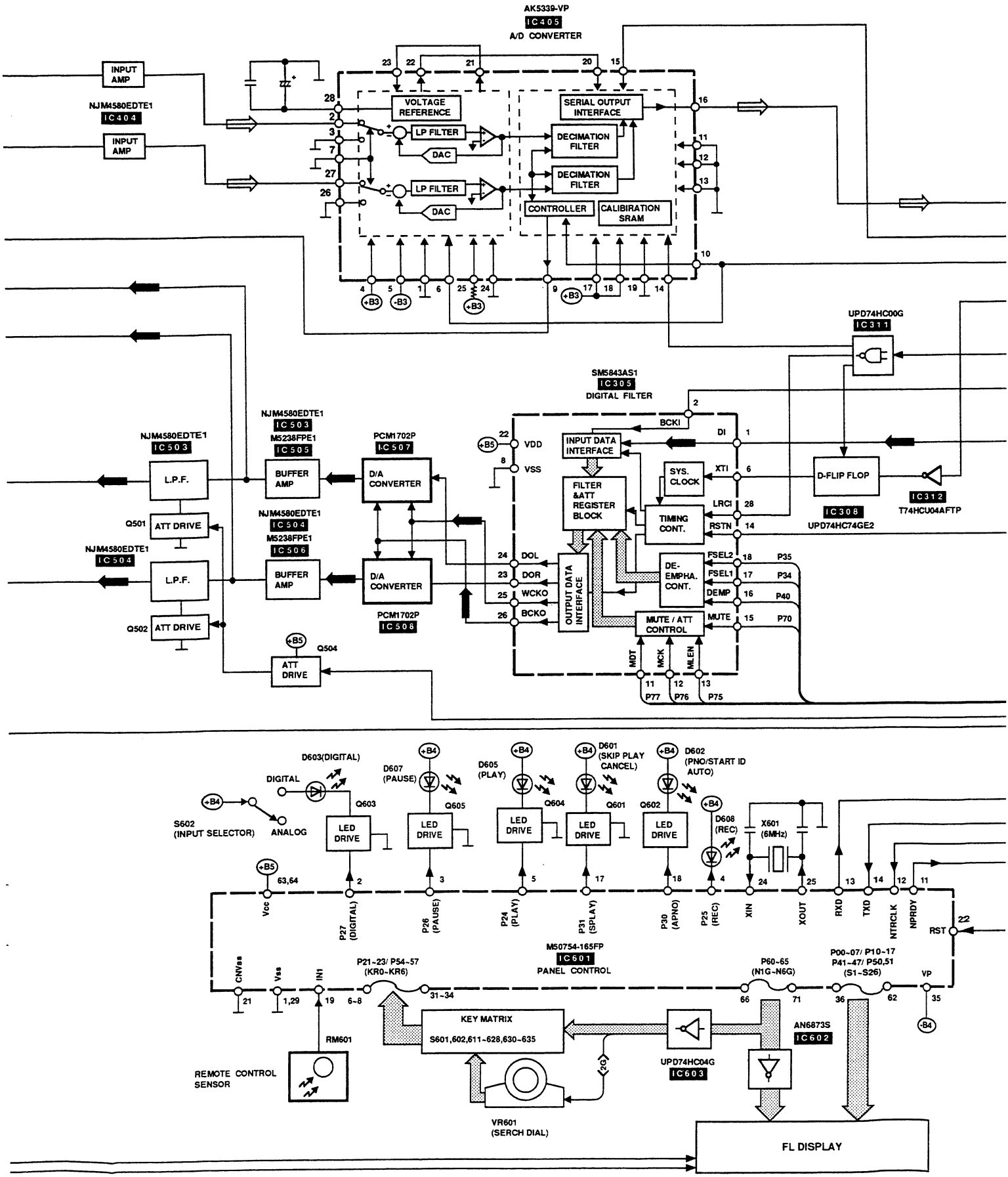
©

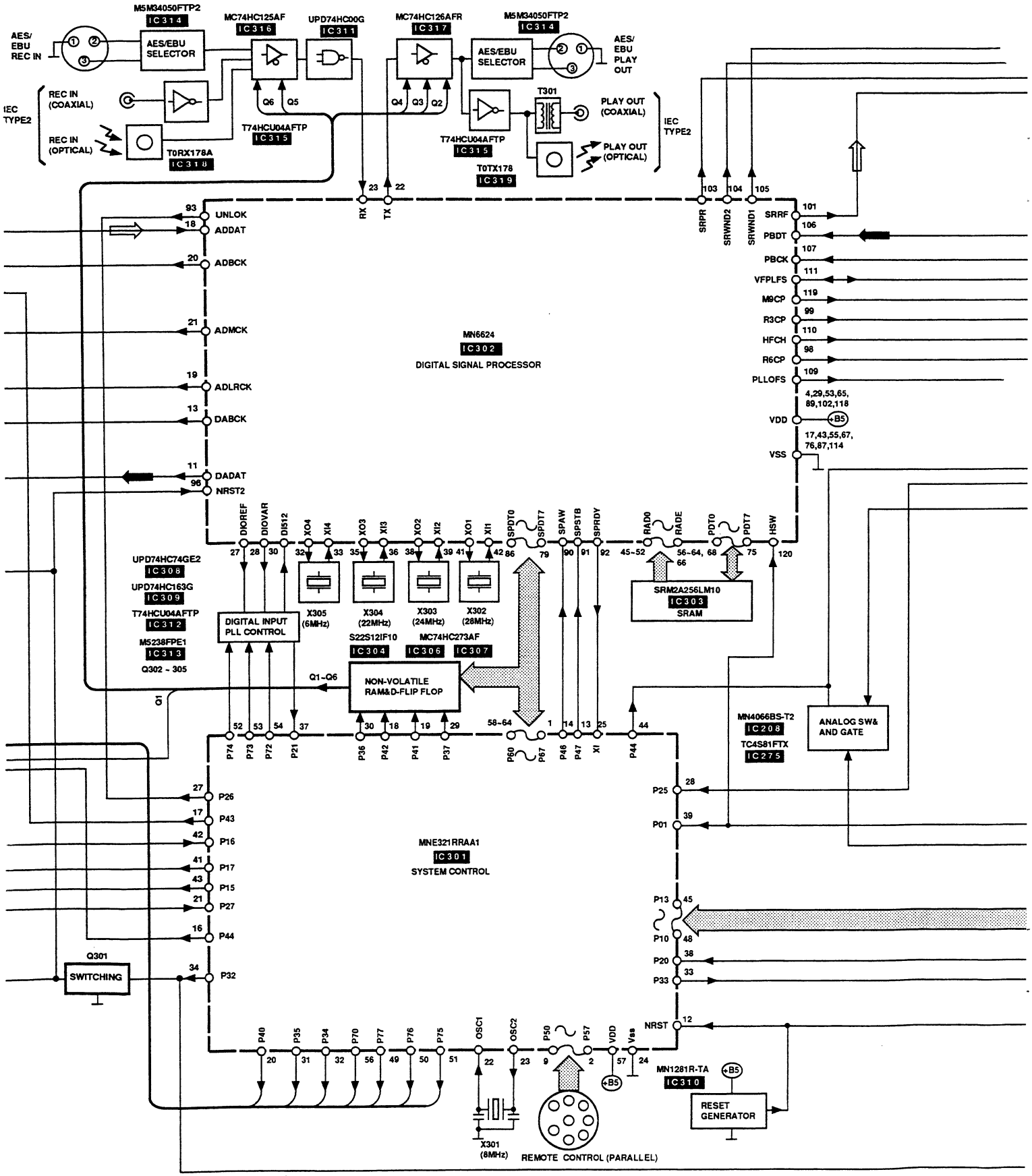


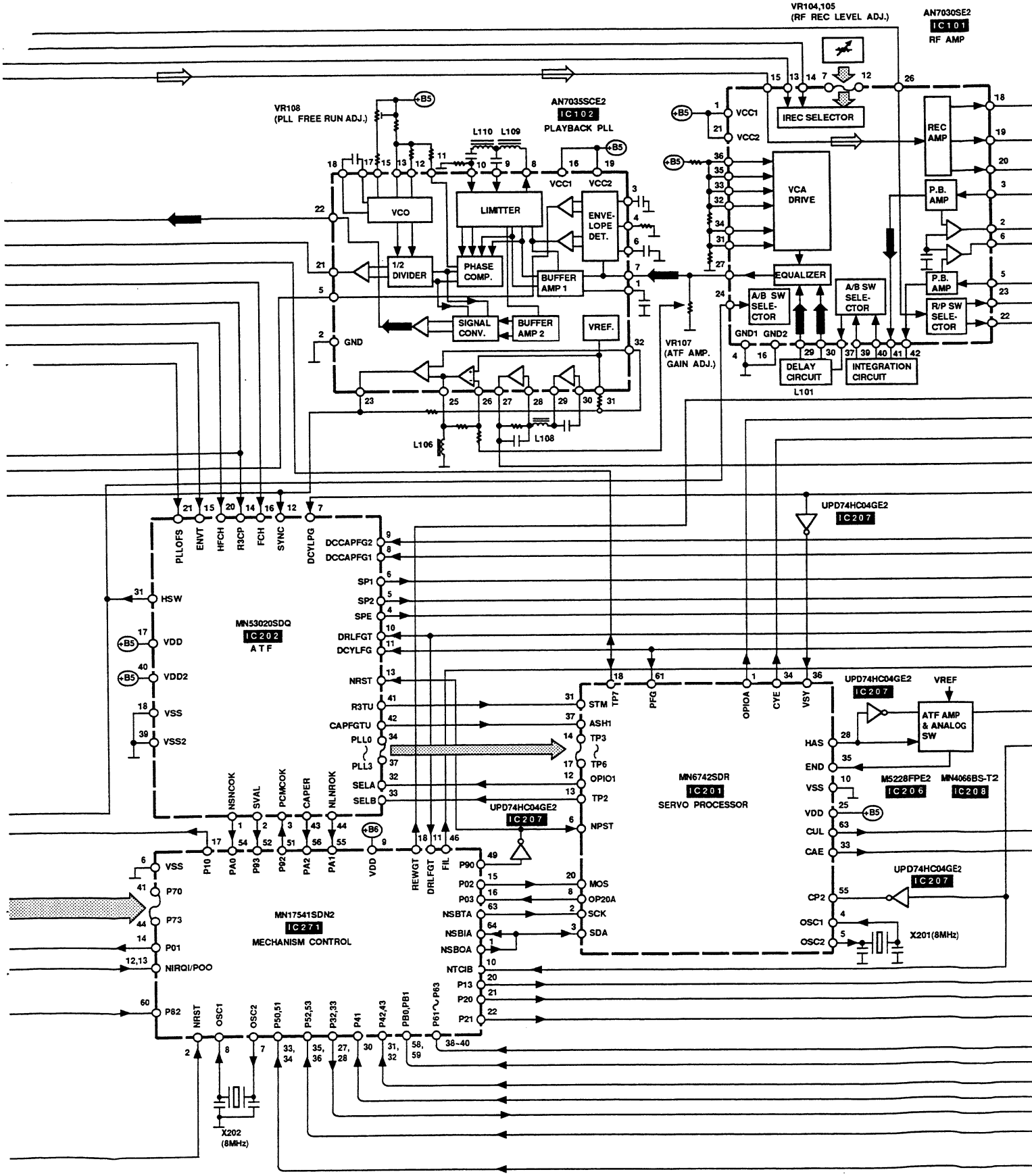


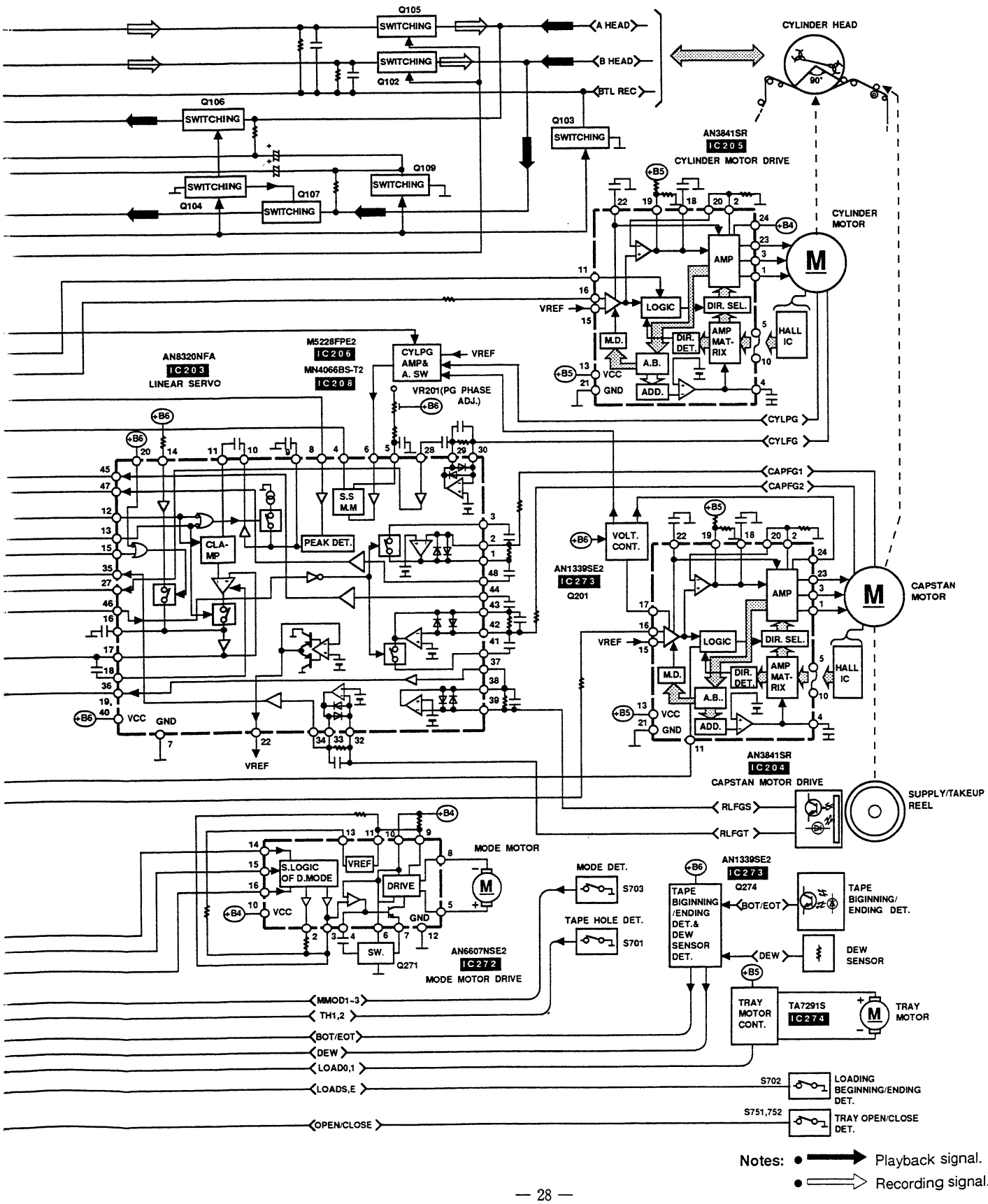
■BLOCK DIAGRAM




AK5339-VP
IC405
A/D CONVERTER
INPUT AMP
NJM4580EDTE1
IC404
INPUT AMP
VOLTAGE REFERENCE
LP FILTER
DAC
LP FILTER
DAC
SERIAL OUTPUT INTERFACE
DECIMATION FILTER
DECIMATION FILTER
CONTROLLER
CALIBIRATION SRAM
+B3
UPD74HC00G
IC311
SM5843AS1
IC305
DIGITAL FILTER
NJM4580EDTE1
IC503
M5238FPE1
IC505
PCM1702P
IC507
NJM4580EDTE1
IC503
L.P.F.
BUFFER AMP
D/A CONVERTER
Q501
ATT DRIVE
NJM4580EDTE1
IC504
M5238FPE1
IC506
NJM4580EDTE1
IC504
L.P.F.
BUFFER AMP
D/A CONVERTER
PCM1702P
IC508
Q502
ATT DRIVE
+B5
Q504
ATT DRIVE
+B5
VDD
VSS
INPUT DATA INTERFACE
FILTER &ATT REGISTER BLOCK
SYS. CLOCK
TIMING CONT.
DE-EMPHA. CONT.
MUTE / ATT CONTROL
OUTPUT DATA INTERFACE
BCKI
DI
XTI
LRCI
RSTN
FSEL2
FSEL1
DEMP
MUTE
DOL
DOR
WCKO
BCKO
MDT
MCK
MLEN
P77
P76
P75
P35
P34
P40
P70
D-FLIP FLOP
IC308
UPD74HC74GE2
IC312
T74HCU04AFTP
D603(DIGITAL)
DIGITAL
ANALOG
S602
(INPUT SELECTOR)
Q603
LED DRIVE
D607
(PAUSE)
Q605
LED DRIVE
D605
(PLAY)
Q604
LED DRIVE
D601
(SKIP PLAY CANCEL)
Q601
LED DRIVE
D602
(PNO/START ID AUTO)
Q602
LED DRIVE
D608
(REC)
X601
(6MHz)
Vcc
P27 (DIGITAL)
P26 (PAUSE)
P24 (PLAY)
P31 (SPLAY)
P30 (APNO)
P25 (REC)
XIN
XOUT
RXD
TXD
NTRCLK
NPRDY
RST
M50754-165FP
IC601
PANEL CONTROL
CNVss
Vss
IN1
P21~23/ P54~57
(KR0~KR6)
P60~65
(N1G~N6G)
P00~07/ P10~17
P41~47/ P50,51
(S1~S26)
VP
KEY MATRIX
S601,602,611~628,630~635
RM601
REMOTE CONTROL SENSOR
UPD74HC04G
IC603
AN6873S
IC602
VR601
(SERCH DIAL)
FL DISPLAY


M5M34050FTP2
IC314
AES/EBU SELECTOR
AES/EBU REC IN
MC74HC125AF
IC316
UPD74HC00G
IC311
MC74HC126AFR
IC317
M5M34050FTP2
IC314
AES/EBU SELECTOR
AES/EBU PLAY OUT
IEC TYPE2
REC IN (COAXIAL)
REC IN (OPTICAL)
T0RX178A
IC318
T74HCU04AFTP
IC315
Q6
Q5
Q4
Q3
Q2
T74HCU04AFTP
IC315
T301
PLAY OUT (COAXIAL)
PLAY OUT (OPTICAL)
T0TX178
IC319
IEC TYPE2
RX
TX
SRPR
SRWND2
SRWND1
UNLOK
ADDAT
ADBCK
ADMCK
ADLRCK
DABCK
DADAT
NRST2
SRRF
PBDT
PBCK
VFPLFS
M9CP
R3CP
HFCH
R6CP
PLLOFS
VDD
VSS
MN6624
IC302
DIGITAL SIGNAL PROCESSOR
DIOREF
DIOVAR
DI512
XO4
XI4
XO3
XI3
XO2
XI2
XO1
XI1
SPDT0
SPDT7
SPAW
SPSTB
SPRDY
RAD0
RADE
PDT0
PDT7
HSW
UPD74HC74GE2
IC308
UPD74HC163G
IC309
T74HCU04AFTP
IC312
M5238FPE1
IC313
Q302 - 305
DIGITAL INPUT PLL CONTROL
X305 (6MHz)
X304 (22MHz)
X303 (24MHz)
X302 (28MHz)
S22S12IF10
IC304
MC74HC273AF
IC306
IC307
NON-VOLATILE RAM&D-FLIP FLOP
Q1-Q6
Q1
SRM2A256LM10
IC303
SRAM
MN4066BS-T2
IC208
TC4S81FTX
IC275
ANALOG SW& AND GATE
P74
P73
P72
P21
P36
P42
P41
P37
P60
P67
P46
P47
XI
P44
P25
P01
P26
P43
P16
P17
P15
P27
P44
P32
MNE321RRAA1
IC301
SYSTEM CONTROL
P13
P10
P20
P33
NRST
Q301
SWITCHING
P40
P35
P34
P70
P77
P76
P75
OSC1
OSC2
P50
P57
VDD
Vss
MN1281R-TA
IC310
RESET GENERATOR
X301 (8MHz)
REMOTE CONTROL (PARALLEL)
+B5


VR104,105
(RF REC LEVEL ADJ.)
AN7030SE2
IC101
RF AMP
VR108
(PLL FREE RUN ADJ.)
AN7035SCE2
IC102
PLAYBACK PLL
L110 L109
VCO
LIMITTER
ENVE-
LOPE
DET.
1/2
DIVIDER
PHASE
COMP.
BUFFER
AMP 1
SIGNAL
CONV.
BUFFER
AMP 2
VREF.
GND
VCC1
VCC2
IREC SELECTOR
VCA
DRIVE
EQUALIZER
A/B SW
SELE-
CTOR
A/B SW
SELE-
CTOR
R/P SW
SELE-
CTOR
REC
AMP
P.B.
AMP
P.B.
AMP
GND1 GND2
DELAY
CIRCUIT
L101
INTEGRATION
CIRCUIT
VR107
(ATF AMP.
GAIN ADJ.)
L106
L108
UPD74HC04GE2
IC207
MN53020SDQ
IC202
ATF
PLLOFS
ENVT
HFCH
R3CP
FCH
SYNC
DCYLPG
DCCAPFG2
DCCAPFG1
SP1
SP2
SPE
DRLFGT
DCYLFG
NRST
R3TU
CAPFGTU
PLL0
PLL3
SELA
SELB
HSW
VDD
VDD2
VSS
VSS2
NSNCOK
SVAL
PCMCOK
CAPER
NLNROK
MN6742SDR
IC201
SERVO PROCESSOR
STM
ASH1
TP3
TP6
OPIO1
TP2
NPST
MOS
OP20A
SCK
SDA
TP7
PFG
OPIOA
CYE
VSY
HAS
END
VSS
VDD
CUL
CAE
CP2
OSC1
OSC2
X201(8MHz)
VREF
ATF AMP
& ANALOG
SW
M5228FPE2
IC206
MN4066BS-T2
IC208
MN17541SDN2
IC271
MECHANISM CONTROL
P10
PA0
P93
P92
PA2
PA1
VDD
REWGT
DRLFGT
FIL
P90
P02
P03
NSBTA
NSBIA
NSBOA
NTCIB
P13
P20
P21
P70
P73
P01
NIRQI/POO
P82
NRST
OSC1
OSC2
P50,51
P52,53
P32,33
P41
P42,43
PB0,PB1
P61~P63
X202
(8MHz)


Q105
SWITCHING
A HEAD
SWITCHING
B HEAD
Q102
BTL REC
Q106
SWITCHING
Q103
SWITCHING
CYLINDER HEAD
90°
AN3841SR
IC205
CYLINDER MOTOR DRIVE
Q109
SWITCHING
SWITCHING
Q107
Q104
SWITCHING
CYLINDER MOTOR
M
AMP
LOGIC
DIR. SEL.
VREF
M.D.
DIR. DET.
AMP MAT-RIX
HALL IC
A.B.
VCC
GND
ADD.
M5228FPE2
IC206
MN4066BS-T2
IC208
AN8320NFA
IC203
LINEAR SERVO
CYLPG AMP& A. SW
VREF
VR201(PG PHASE ADJ.)
CYLPG
CYLFG
CAPFG1
CAPFG2
S.S M.M
PEAK DET.
CLA-MP
VOLT. CONT.
AN1339SE2
IC273
Q201
CAPSTAN MOTOR
AN3841SR
IC204
CAPSTAN MOTOR DRIVE
SUPPLY/TAKEUP REEL
RLFGS
RLFGT
MODE MOTOR
S.LOGIC OF D.MODE
DRIVE
SW.
Q271
AN6607NSE2
IC272
MODE MOTOR DRIVE
MODE DET.
S703
TAPE HOLE DET.
S701
TAPE BIGINNING /ENDING DET.& DEW SENSOR DET.
AN1339SE2
IC273
Q274
BOT/EOT
DEW
TAPE BIGINNING/ ENDING DET.
DEW SENSOR
TRAY MOTOR CONT.
TA7291S
IC274
TRAY MOTOR
MMOD1-3
TH1,2
BOT/EOT
DEW
LOAD0,1
LOADS,E
OPEN/CLOSE
S702
LOADING BEGINNING/ENDING DET.
S751,752
TRAY OPEN/CLOSE DET.
Notes: Playback signal.
Recording signal.

■ SCHEMATIC DIAGRAM (Parts list on pages 76~81.)

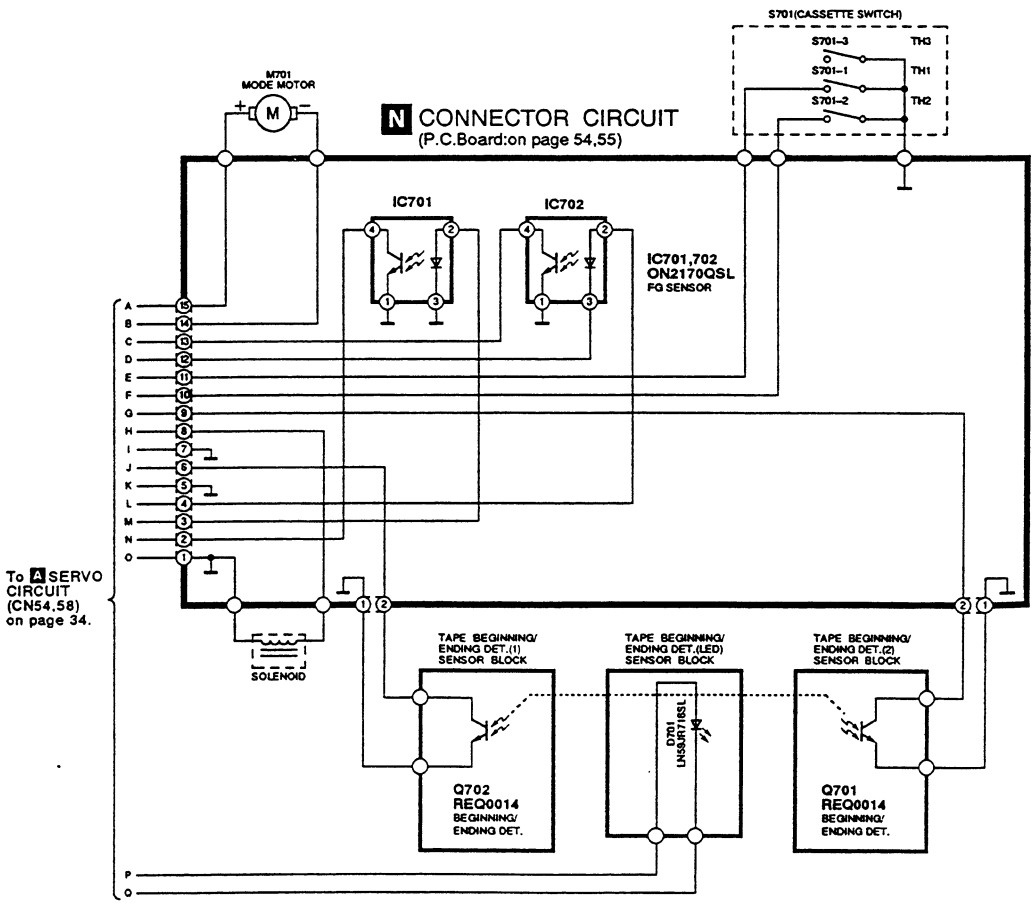
(This schematic diagram may be modified at any time with the development of new technology.)

Note :

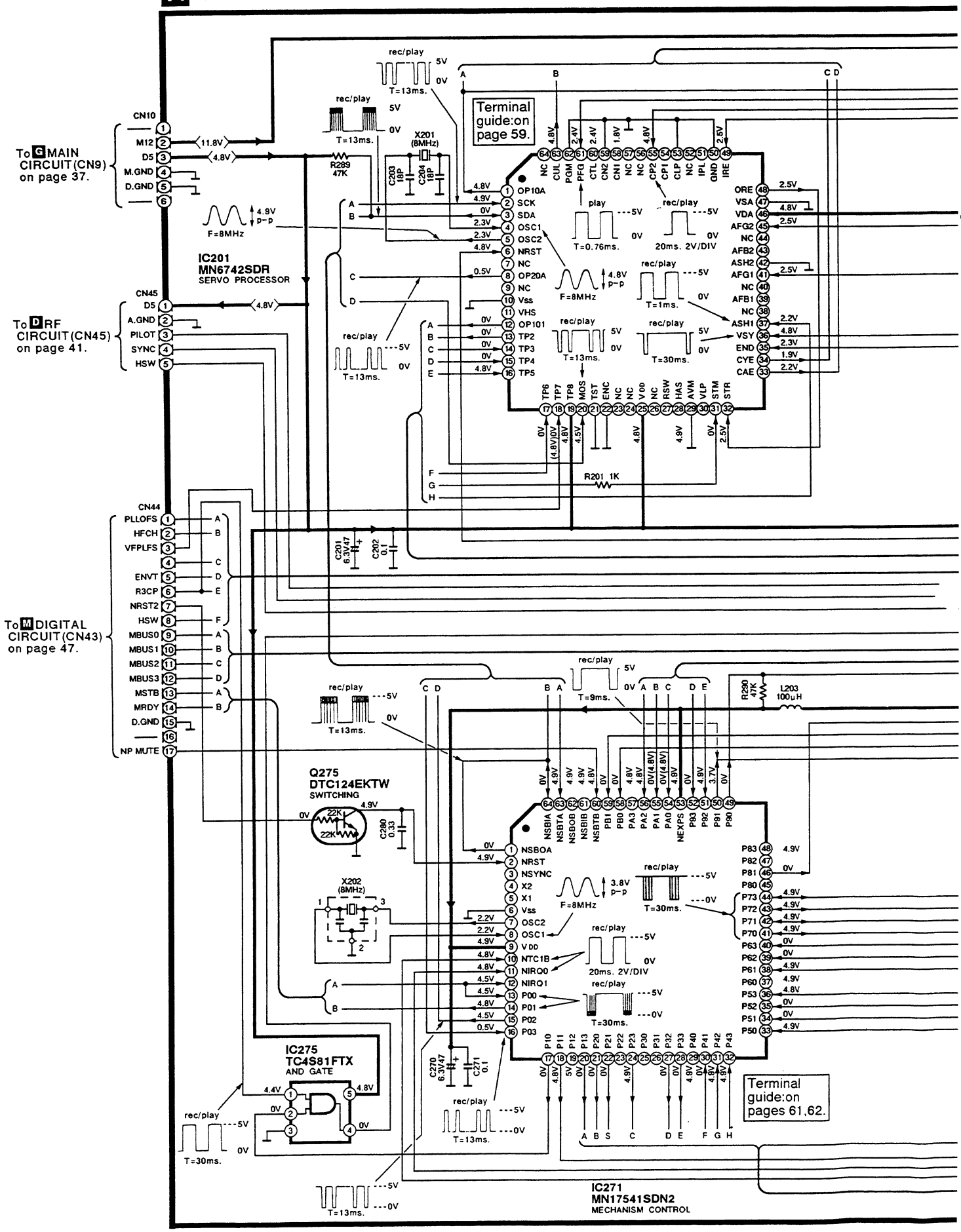
- **S1** : Power switch (POWER).
- **S601** : Sampling frequency selector (SAMPLING FREQUENCY) (44.1kHz ↔ 48kHz).
- **S602** : Input selector switch (INPUT). (▁ DIGITAL/ ▁ ANALOG).
- **S611** : ID erase switch (ID ERASE).
- **S612** : End search switch (END SEARCH).
- **S613** : Start ID switch (START ID).
- **S614** : Skip ID switch (SKIP ID).
- **S615** : End switch (END).
- **S616** : Counter reset switch (COUNTER RESET).
- **S617** : Renumber switch (RENUMBER).
- **S618** : Rew/rev switch (REW/REV).
- **S619** : FF/cue switch (FF/CUE).
- **S620** : Fade out switch (FADE OUT).
- **S621** : Fade in switch (FADE IN).
- **S622** : PNO/start ID auto switch (PNO/START ID AUTO).
- **S623** : Counter mode switch (COUNTER MODE).
- **S624, 625** : Skip switches (SKIP). [S624 |◀◀ , S625 ▶▶|]
- **S626** : Pause switch (PAUSE).
- **S627** : Record switch (REC).
- **S628** : Auto rec mute switch (AUTO REC MUTE).
- **S630** : ID write switch (ID WRITE).
- **S631** : Play switch (PLAY).
- **S632** : Stop switch (STOP).
- **S633** : Skip play cancel switch (SKIP PLAY CANCEL).
- **S634** : Music scan switch (MUSIC SCAN).
- **S635** : Open/close switch (OPEN/CLOSE).
- **S751** : Cassette tray open detection switch.
- **S752** : Cassette tray close detection switch.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).....Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (▬▬) indicates +B (bias).
- (▬ ▬ ▬) indicates −B (bias).
- (▬▶) indicates the flow of the playback signal.
- (▭▶) indicates the flow of the recording signal.

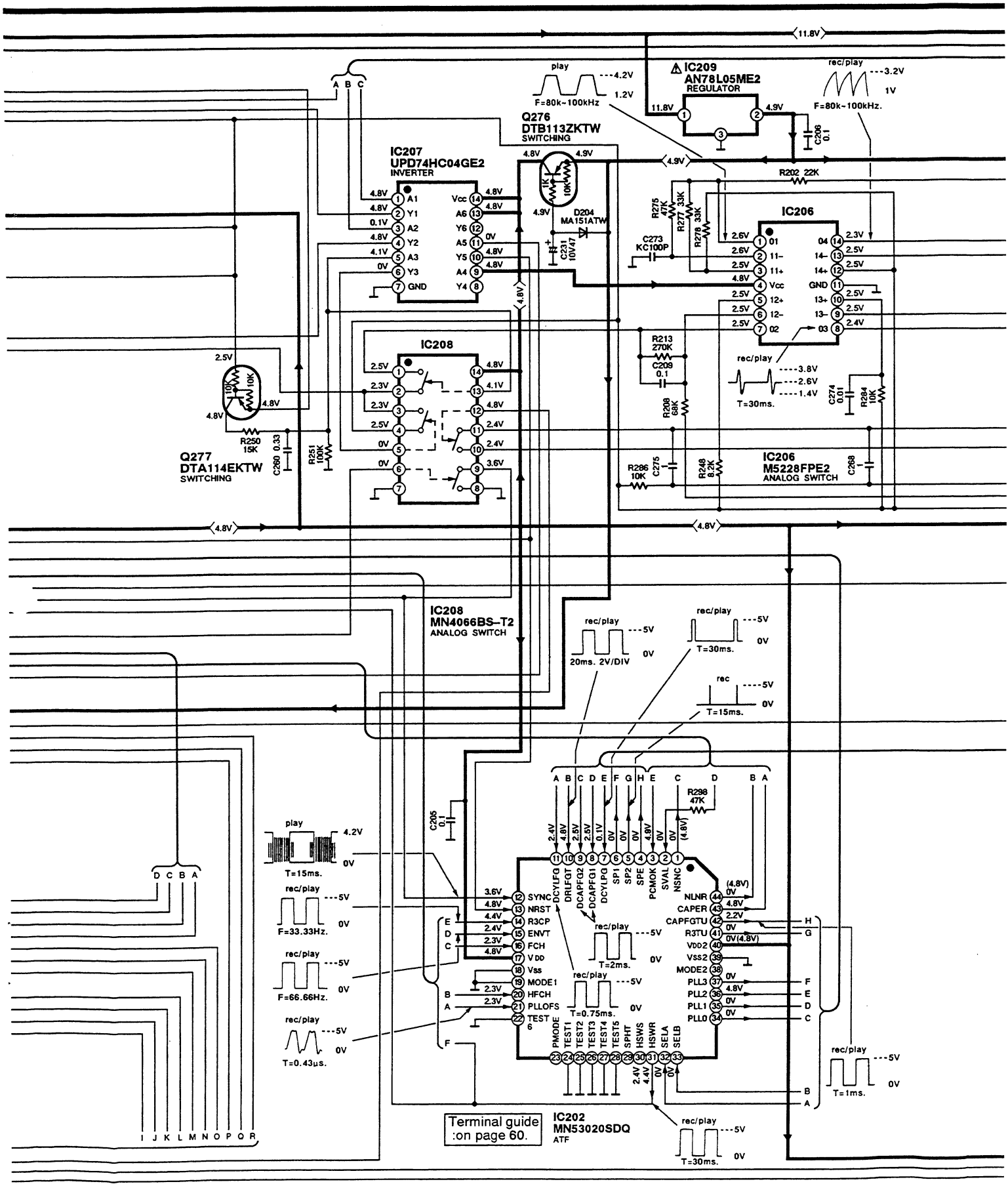
*** Caution!**

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
* Cover the parts boxes made of plastics with aluminum foil.
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with fingers directly.

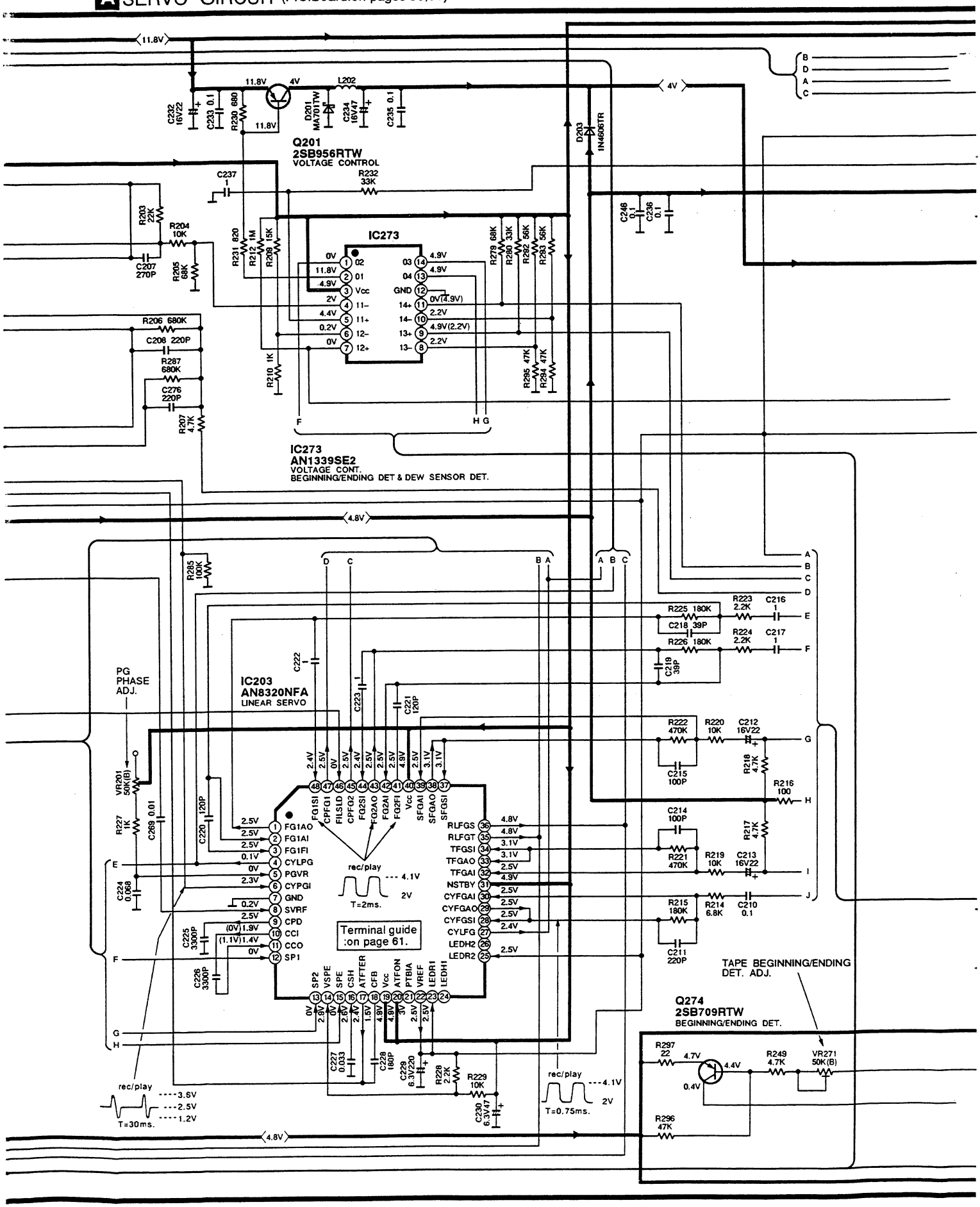


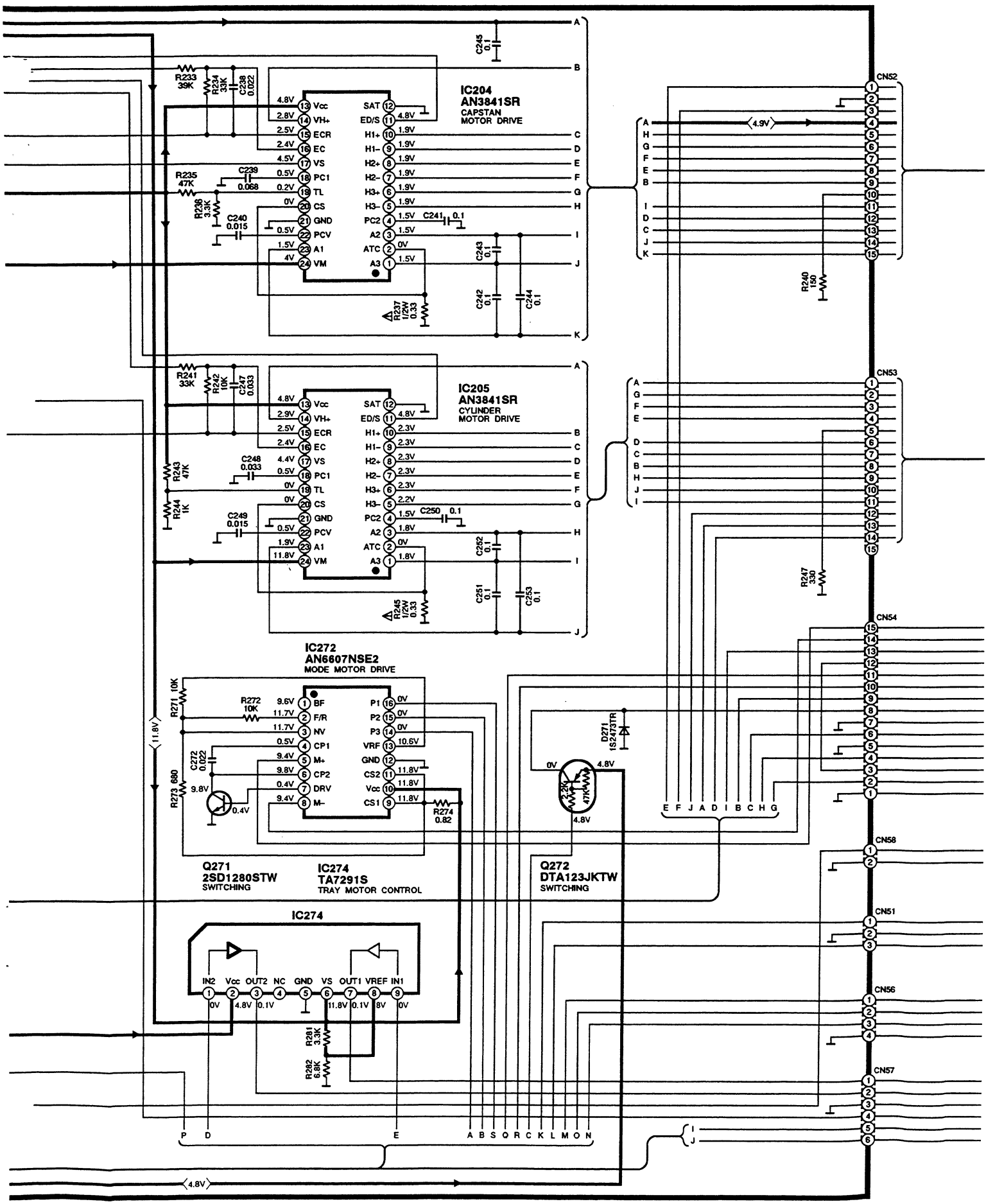
A SERVO CIRCUIT (P.C.Board:on pages 50,51)

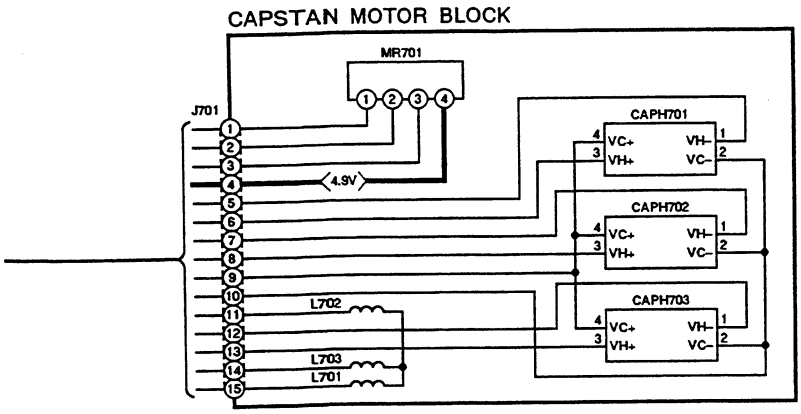


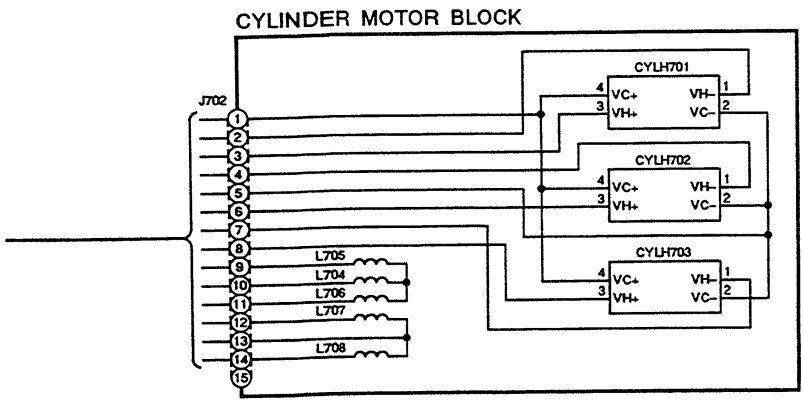

11.8V
play
4.2V
1.2V
F=80k-100kHz
IC209
AN78L05ME2
REGULATOR
rec/play
3.2V
1V
F=80k-100kHz.
Q276
DTB113ZKTW
SWITCHING
IC207
UPD74HC04GE2
INVERTER
R202 22K
IC206
D204
MA151ATW
C273
KC100P
R213
270K
C209
0.1
rec/play
3.8V
2.6V
1.4V
T=30ms.
R208
68K
C274
0.01
R284
10K
Q277
DTA114EKTW
SWITCHING
R250
15K
C260
0.33
R251
100K
IC208
R286
10K
C275
R248
8.2K
IC206
M5228FPE2
ANALOG SWITCH
C268
4.8V
IC208
MN4066BS-T2
ANALOG SWITCH
rec/play
5V
0V
20ms. 2V/DIV
T=30ms.
rec
T=15ms.
C205
0.1
R298
47K
play
4.2V
T=15ms.
F=33.33Hz.
F=66.66Hz.
T=0.43µs.
SYNC
NRST
R3CP
ENVT
FCH
VDD
Vss
MODE1
HFCH
PLLOFS
TEST 6
NLNR
CAPER
CAPFGTU
R3TU
VDD2
VSS2
MODE2
PLL3
PLL2
PLL1
PLL0
T=2ms.
T=0.75ms.
T=1ms.
Terminal guide
:on page 60.
IC202
MN53020SDQ
ATF

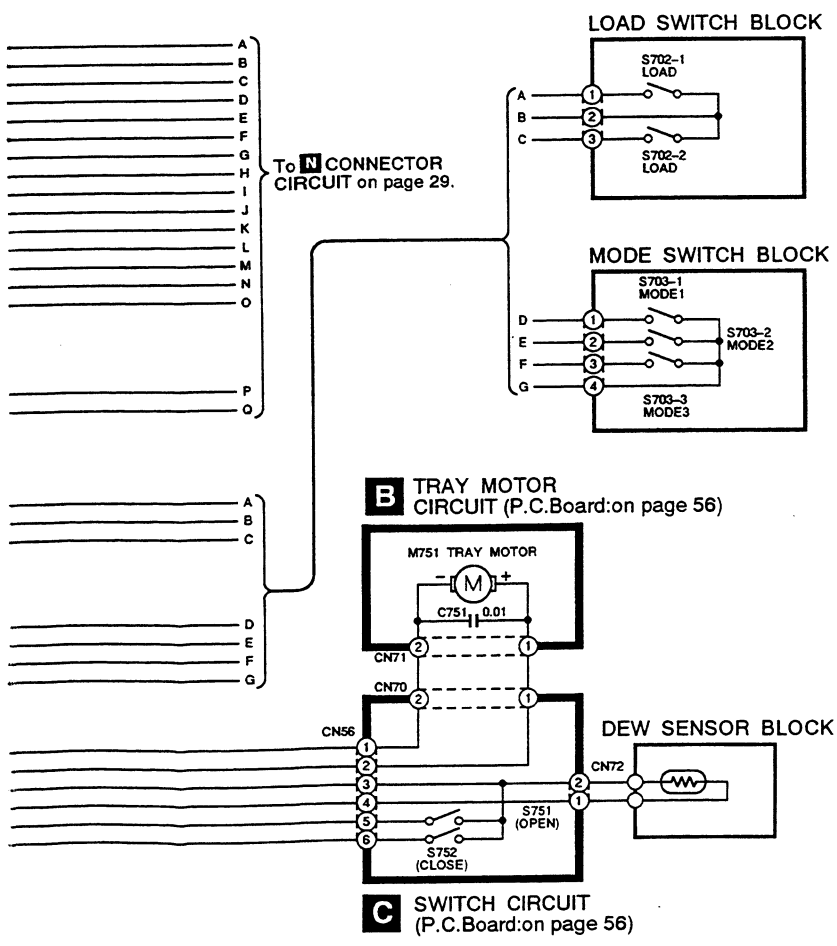
A SERVO CIRCUIT (P.C.Board:on pages 50,51)



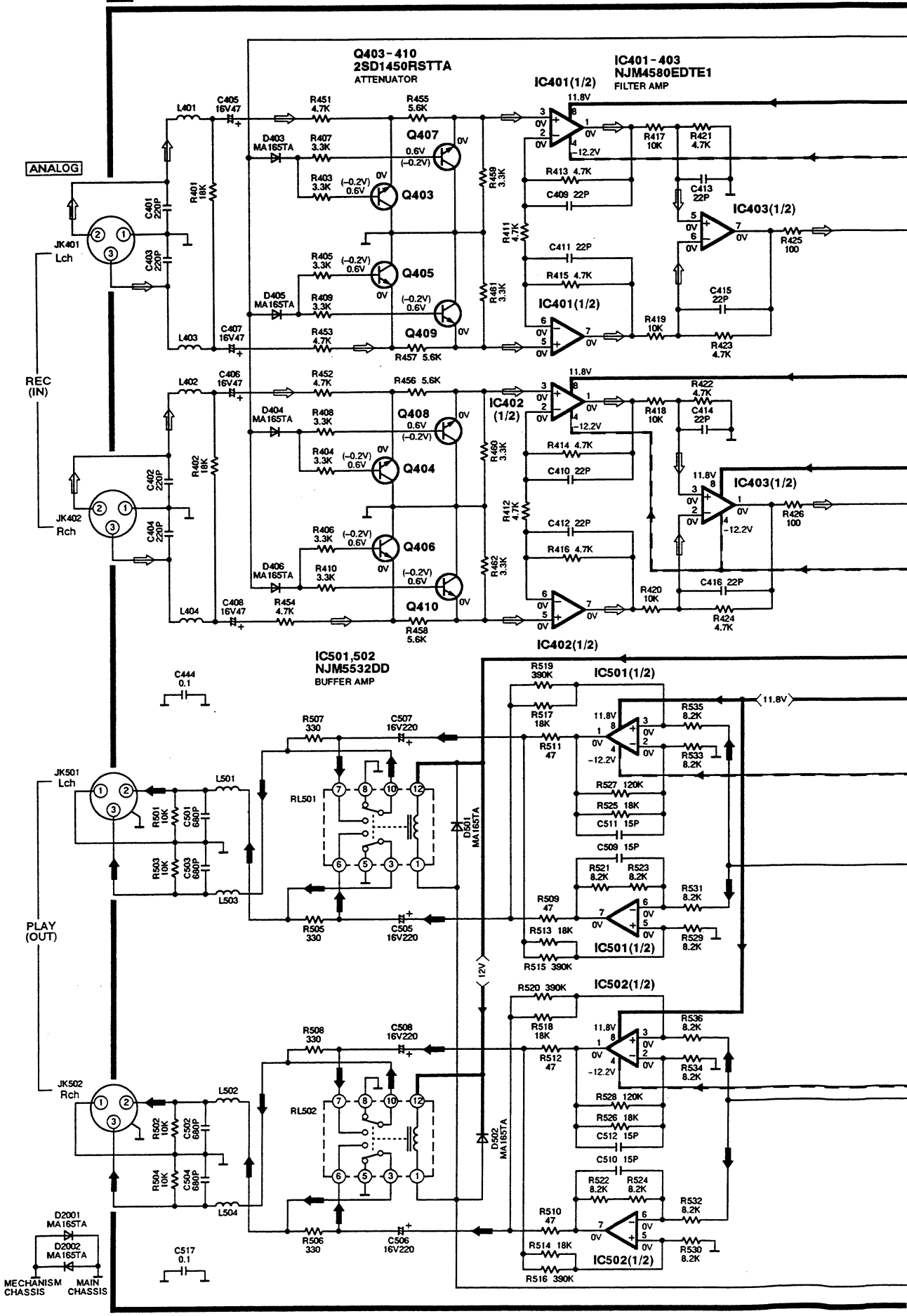

IC204
AN3841SR
CAPSTAN
MOTOR DRIVE
IC205
AN3841SR
CYLINDER
MOTOR DRIVE
IC272
AN6607NSE2
MODE MOTOR DRIVE
Q271
2SD1280STW
SWITCHING
IC274
TA7291S
TRAY MOTOR CONTROL
Q272
DTA123JKTW
SWITCHING
IC274
CN52
CN53
CN54
CN58
CN51
CN56
CN57

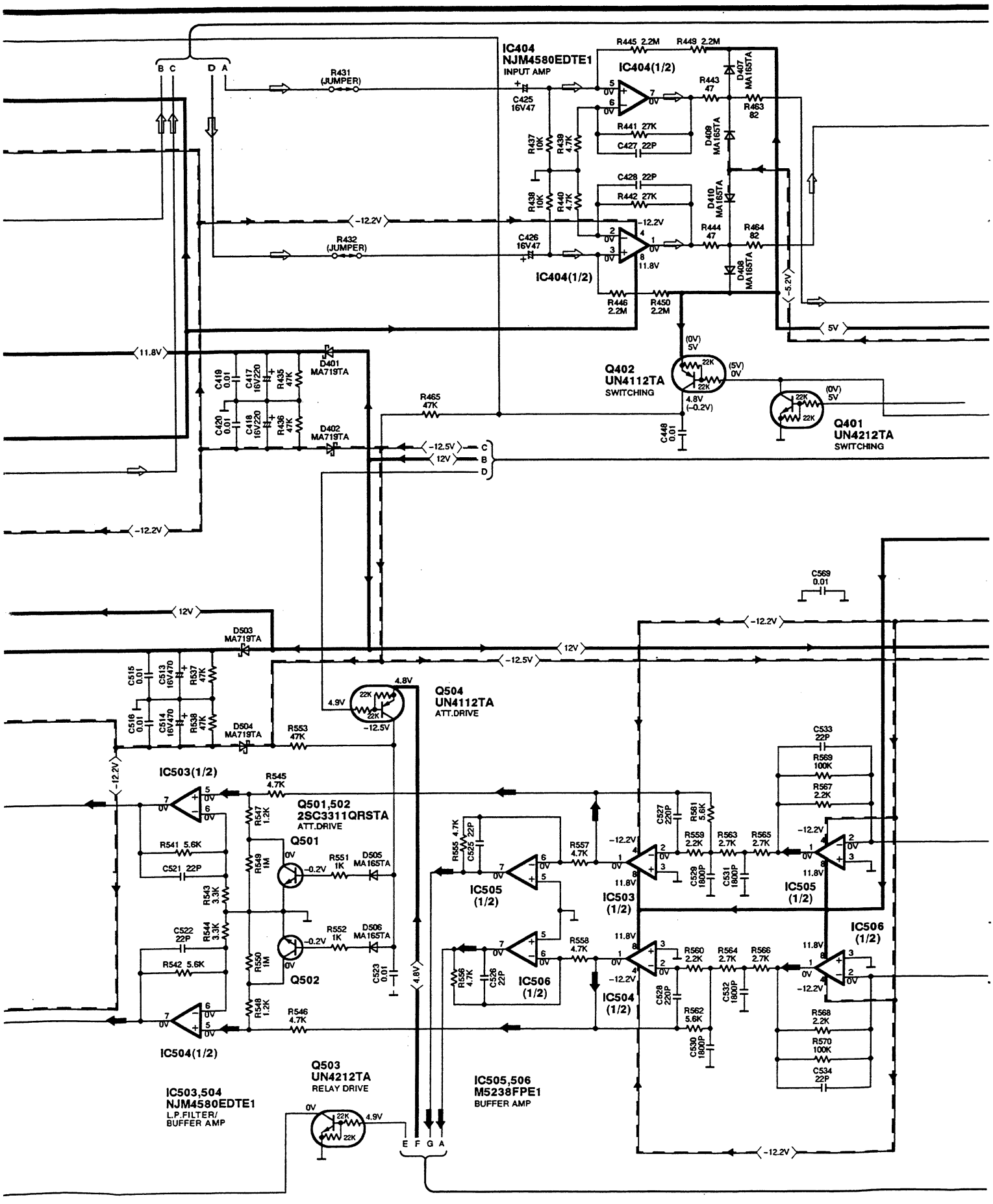

CAPSTAN MOTOR BLOCK
MR701
J701
4.9V
CAPH701
CAPH702
CAPH703
VC+
VH+
VH-
VC-
L702
L703
L701

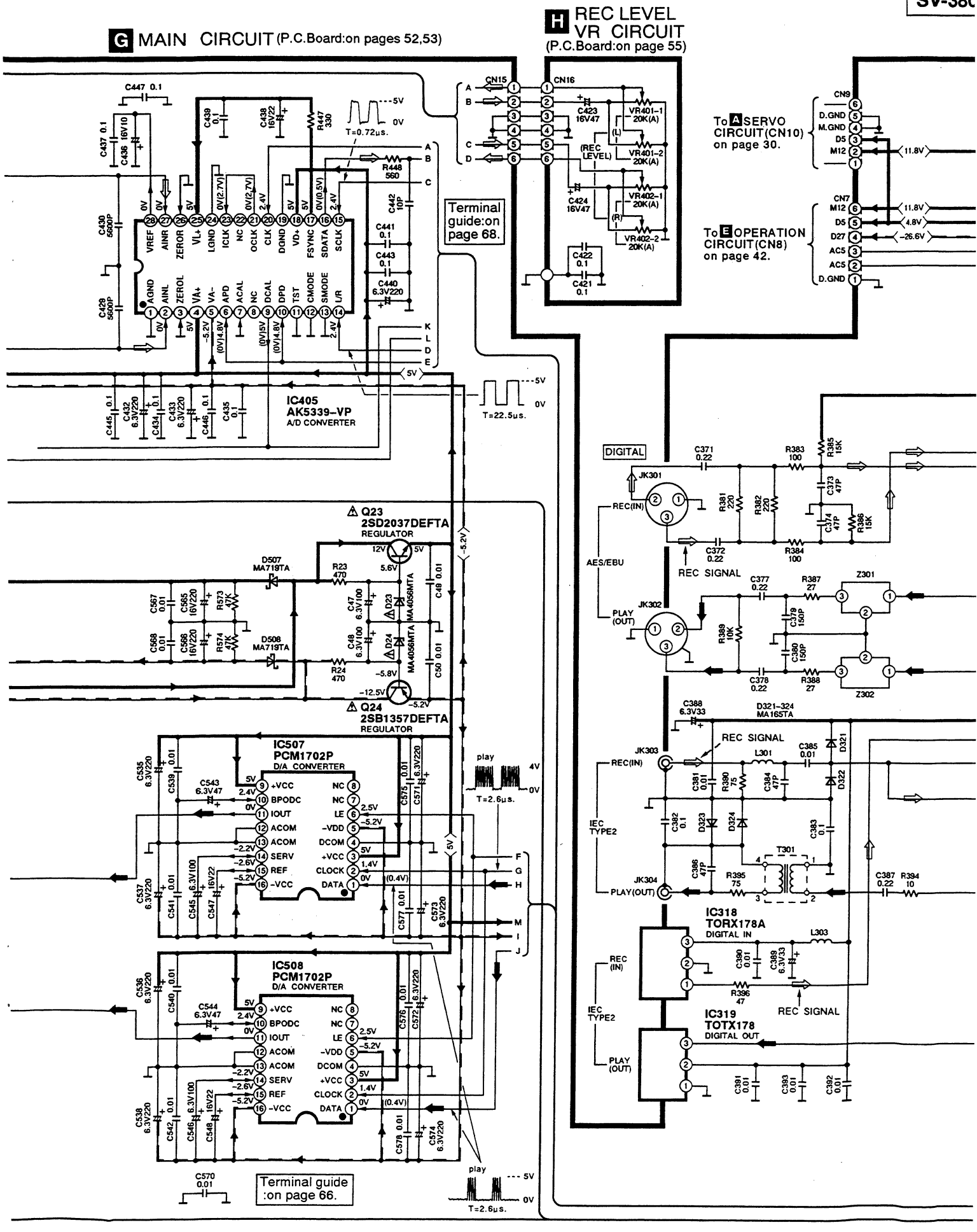

CYLINDER MOTOR BLOCK
J702
CYLH701
CYLH702
CYLH703
VC+
VH+
VH-
VC-
L705
L704
L706
L707
L708

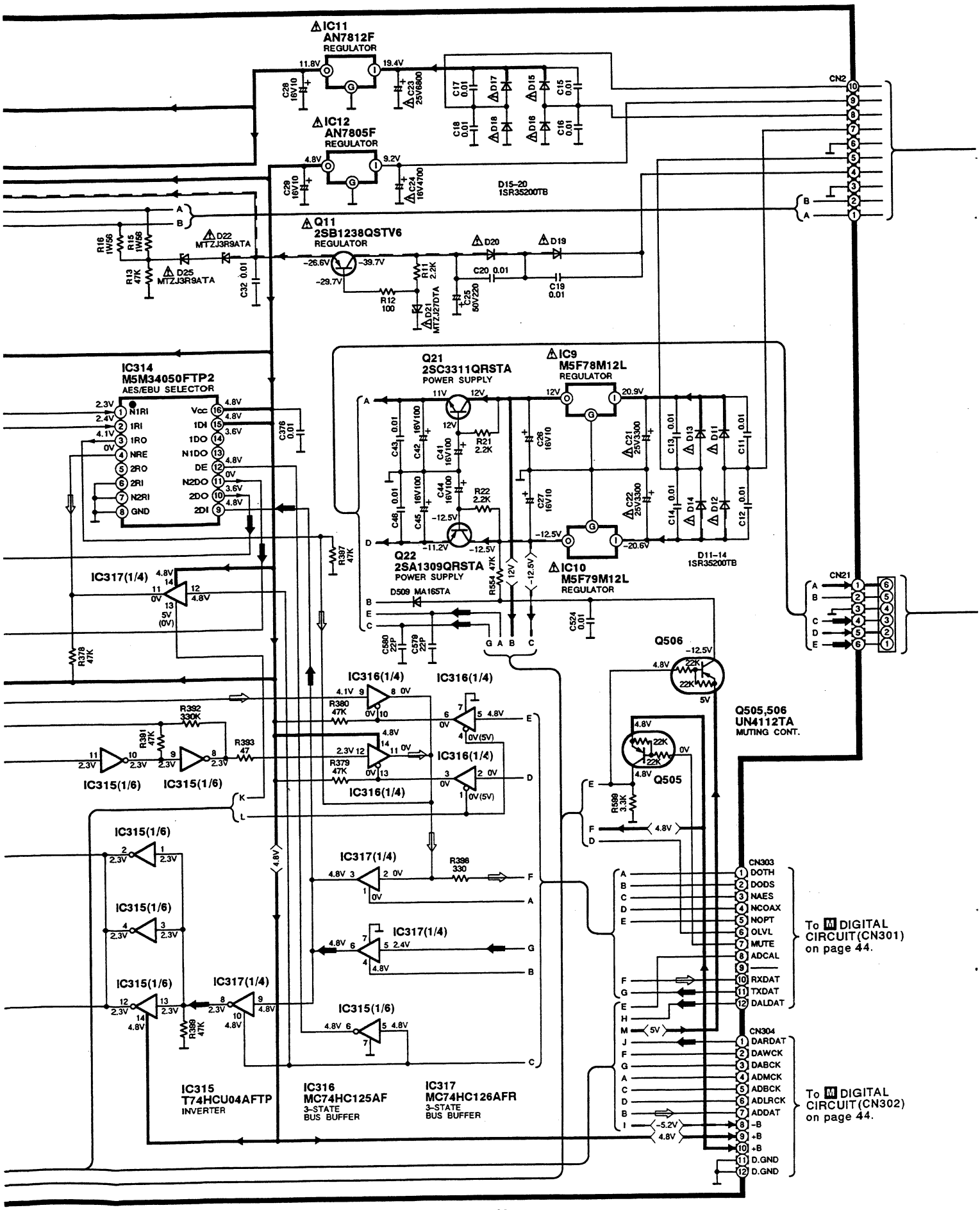

LOAD SWITCH BLOCK
S702-1 LOAD
S702-2 LOAD
MODE SWITCH BLOCK
S703-1 MODE1
S703-2 MODE2
S703-3 MODE3
To N CONNECTOR CIRCUIT on page 29.
B TRAY MOTOR CIRCUIT (P.C.Board:on page 56)
M751 TRAY MOTOR
C751 0.01
CN71
CN70
CN56
DEW SENSOR BLOCK
CN72
S751 (OPEN)
S752 (CLOSE)
C SWITCH CIRCUIT (P.C.Board:on page 56)

G MAIN CIRCUIT (P.C.Board:on pages 52,53)




IC404
NJM4580EDTE1
INPUT AMP
IC404(1/2)
IC404(1/2)
R431 (JUMPER)
R432 (JUMPER)
C425 16V47
C426 16V47
R445 2.2M
R449 2.2M
R443 47
R463 82
R441 27K
C427 22P
R437 10K
R439 4.7K
R438 10K
R440 4.7K
C428 22P
R442 27K
R444 47
R464 82
R446 2.2M
R450 2.2M
D407 MA165TA
D409 MA165TA
D410 MA165TA
D408 MA165TA
-12.2V
11.8V
-5.2V
5V
Q402
UN4112TA
SWITCHING
Q401
UN4212TA
SWITCHING
R465 47K
C446 0.01
D401 MA719TA
D402 MA719TA
C419 0.01
C417 16V220
R435 47K
C420 0.01
C418 16V220
R436 47K
-12.5V
12V
C
B
D
D503 MA719TA
C569 0.01
C515 0.01
C513 16V470
R537 47K
C516 0.01
C514 16V470
R538 47K
D504 MA719TA
R553 47K
Q504
UN4112TA
ATT.DRIVE
IC503(1/2)
R545 4.7K
Q501,502
2SC3311QRSTA
ATT.DRIVE
Q501
Q502
R547 1.2K
R549 1M
R551 1K
D505 MA165TA
R552 1K
D506 MA165TA
R550 1M
R548 1.2K
R546 4.7K
R541 5.6K
C521 22P
R543 3.3K
R544 3.3K
C522 22P
R542 5.6K
C523 0.01
IC504(1/2)
Q503
UN4212TA
RELAY DRIVE
IC503,504
NJM4580EDTE1
L.P.FILTER/
BUFFER AMP
IC505,506
M5238FPE1
BUFFER AMP
E F G A
R555 4.7K
C525 22P
R557 4.7K
R556 4.7K
C526 22P
R558 4.7K
IC505 (1/2)
IC506 (1/2)
IC503 (1/2)
IC504 (1/2)
C527 220P
R561 5.6K
R559 2.2K
R563 2.7K
R565 2.7K
C529 1800P
C531 1800P
C528 220P
R562 5.6K
C530 1800P
R560 2.2K
R564 2.7K
R566 2.7K
C532 1800P
C533 22P
R569 100K
R567 2.2K
R568 2.2K
R570 100K
C534 22P
IC505
(1/2)
IC506
(1/2)

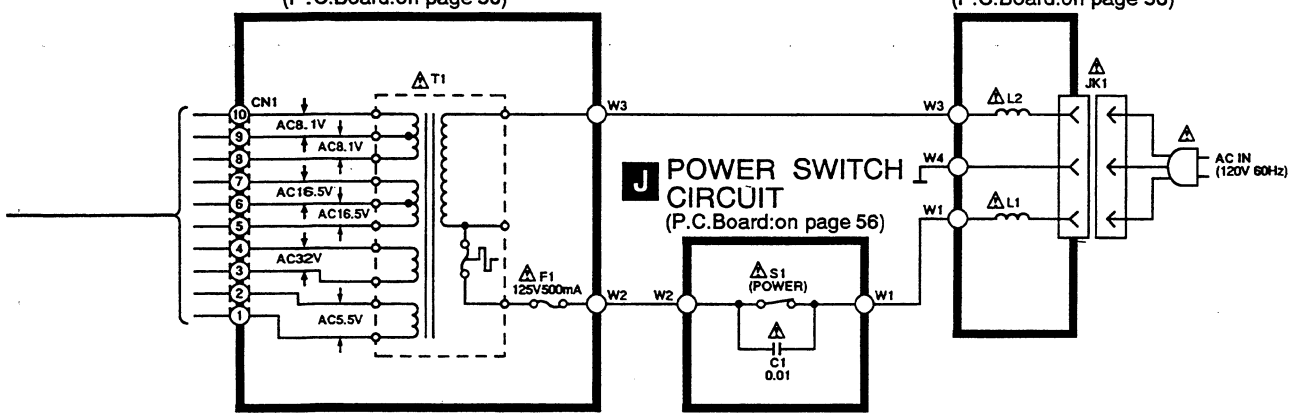

G MAIN CIRCUIT (P.C.Board:on pages 52,53)
H REC LEVEL VR CIRCUIT (P.C.Board:on page 55)
IC405 AK5339-VP A/D CONVERTER
Q23 2SD2037DEFTA REGULATOR
Q24 2SB1357DEFTA REGULATOR
IC507 PCM1702P D/A CONVERTER
IC508 PCM1702P D/A CONVERTER
IC318 TORX178A DIGITAL IN
IC319 TOTX178 DIGITAL OUT
To A SERVO CIRCUIT(CN10) on page 30.
To E OPERATION CIRCUIT(CN8) on page 42.
Terminal guide:on page 68.
Terminal guide :on page 66.
DIGITAL
REC SIGNAL
AES/EBU
IEC TYPE2
REC(IN)
PLAY(OUT)


IC11
AN7812F
REGULATOR
IC12
AN7805F
REGULATOR
D15-20
1SR35200TB
Q11
2SB1238QSTV6
REGULATOR
IC314
M5M34050FTP2
AES/EBU SELECTOR
Q21
2SC3311QRSTA
POWER SUPPLY
IC9
M5F78M12L
REGULATOR
Q22
2SA1309QRSTA
POWER SUPPLY
IC10
M5F79M12L
REGULATOR
D509 MA165TA
D11-14
1SR35200TB
Q506
Q505,506
UN4112TA
MUTING CONT.
Q505
IC315(1/6)
IC316(1/4)
IC317(1/4)
IC315
T74HCU04AFTP
INVERTER
IC316
MC74HC125AF
3-STATE
BUS BUFFER
IC317
MC74HC126AFR
3-STATE
BUS BUFFER
CN2
CN21
CN303
CN304
To M DIGITAL CIRCUIT(CN301) on page 44.
To M DIGITAL CIRCUIT(CN302) on page 44.

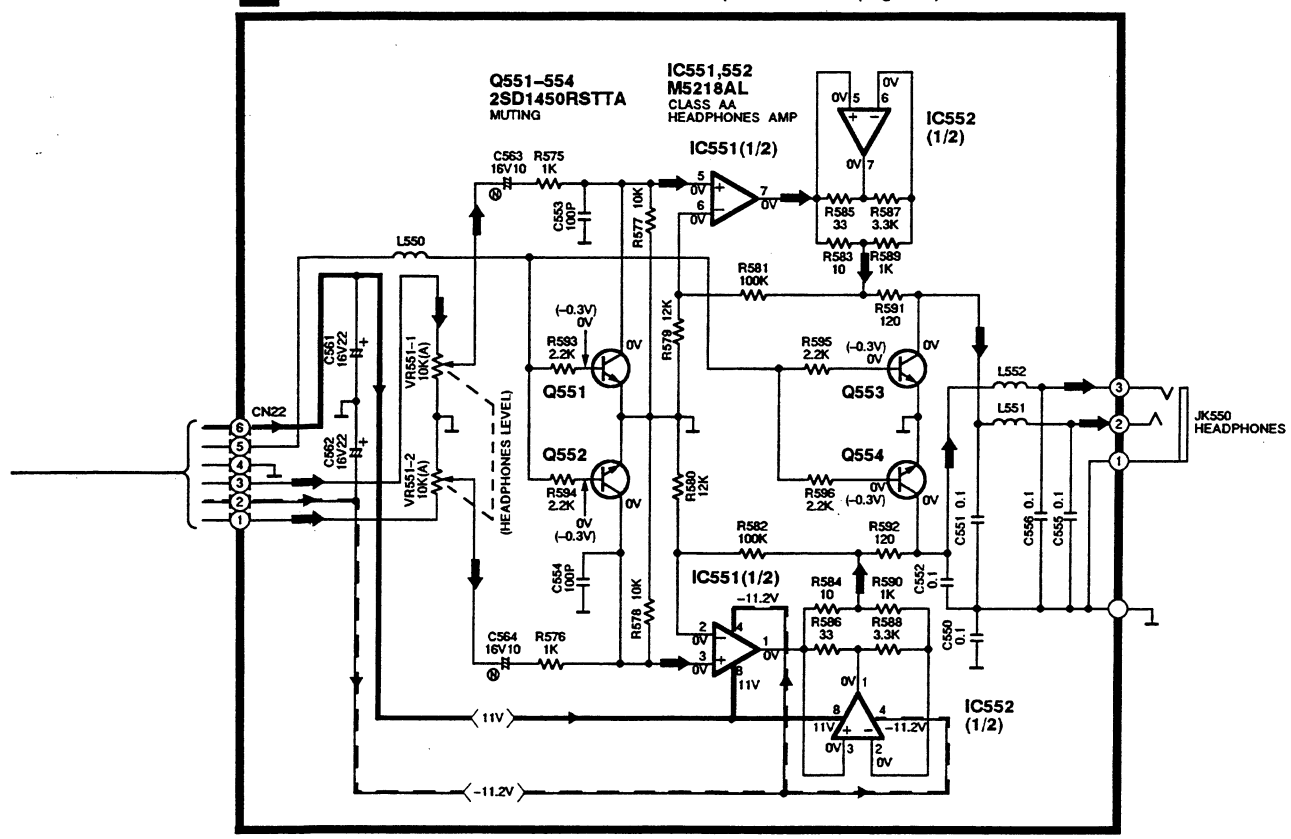
I POWER TRANSFORMER CIRCUIT
(P.C.Board:on page 56)

K AC IN CIRCUIT
(P.C.Board:on page 56)

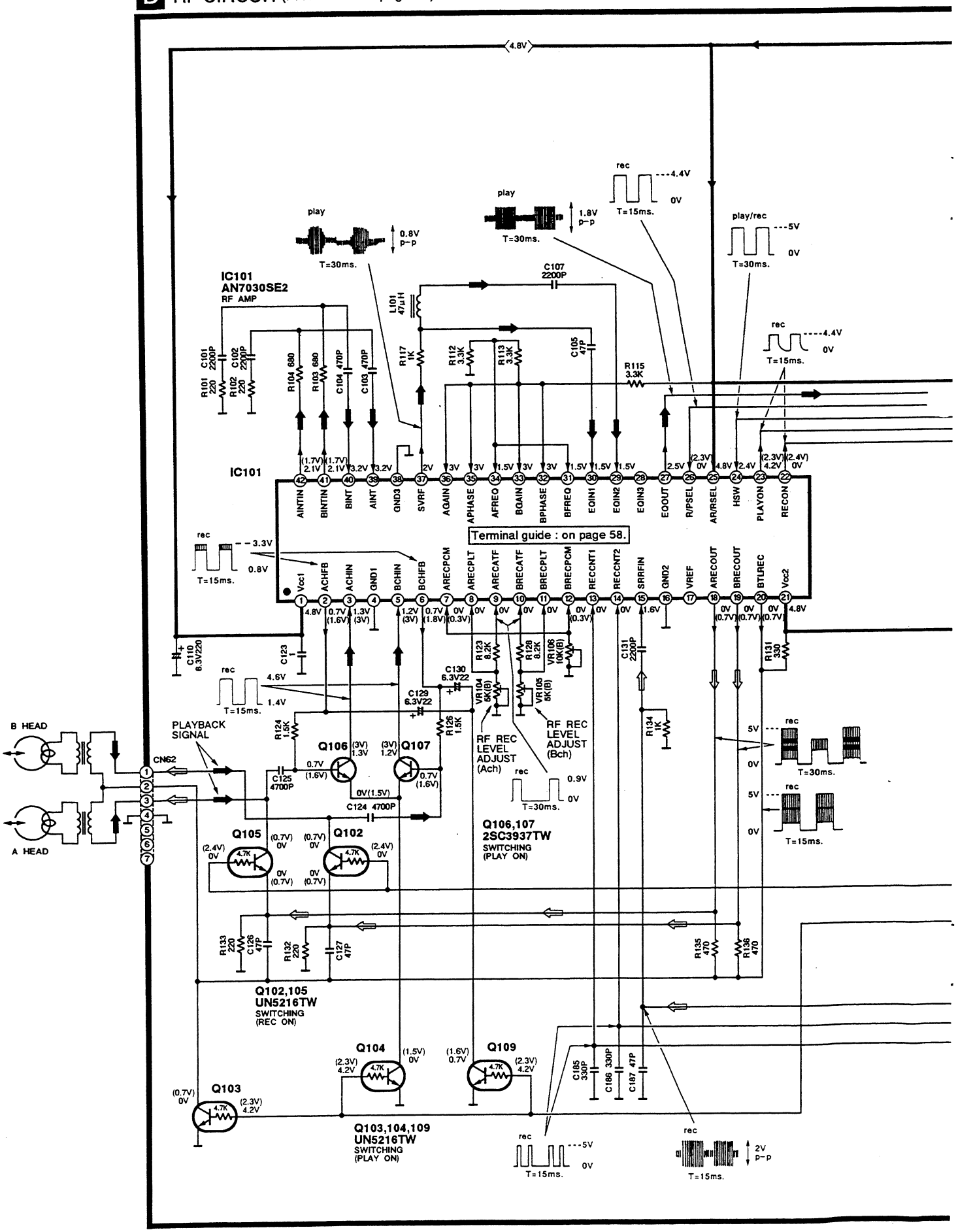
J POWER SWITCH CIRCUIT
(P.C.Board:on page 56)

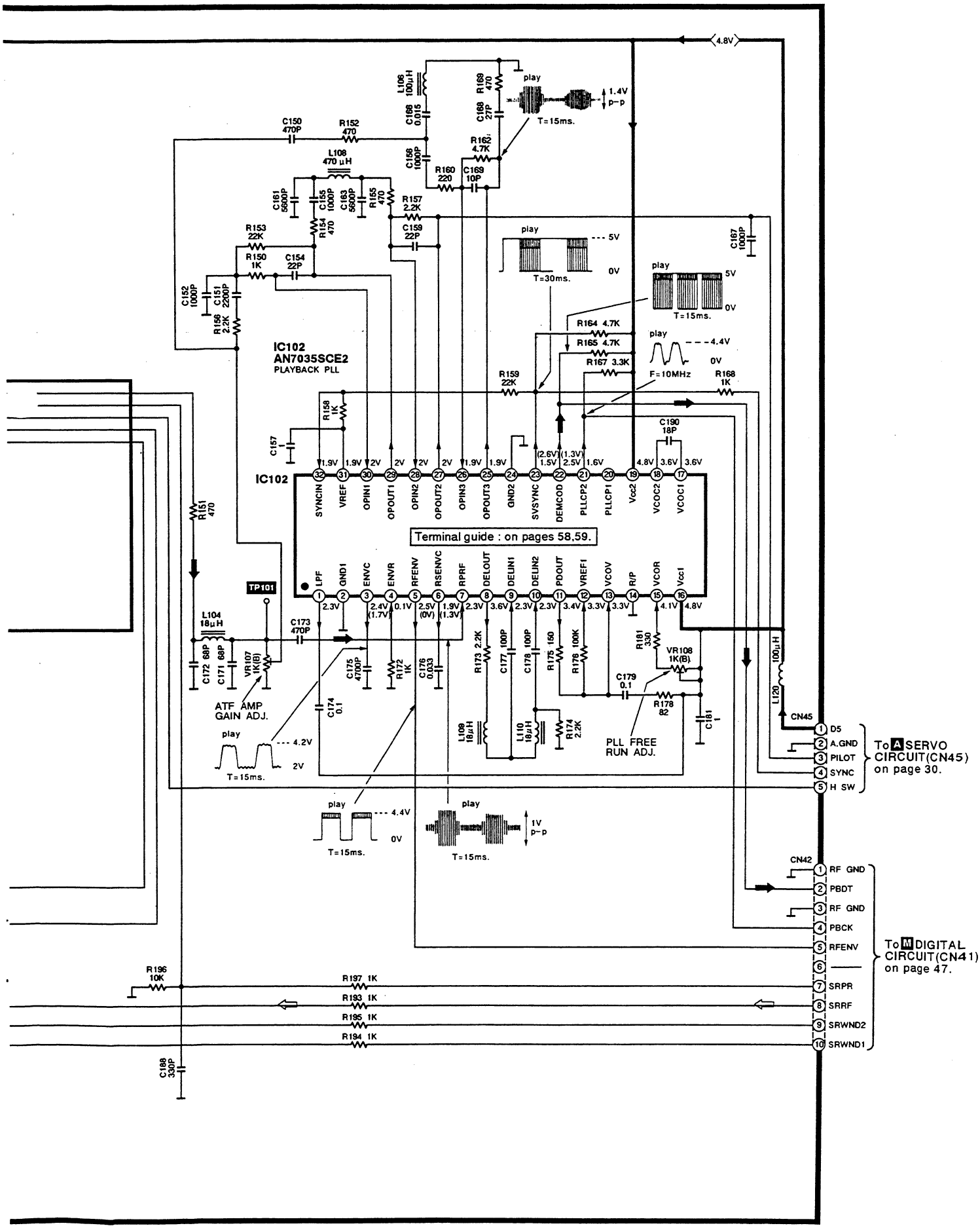


L HEADPHONES JACK CIRCUIT (P.C.Board:on page 52)

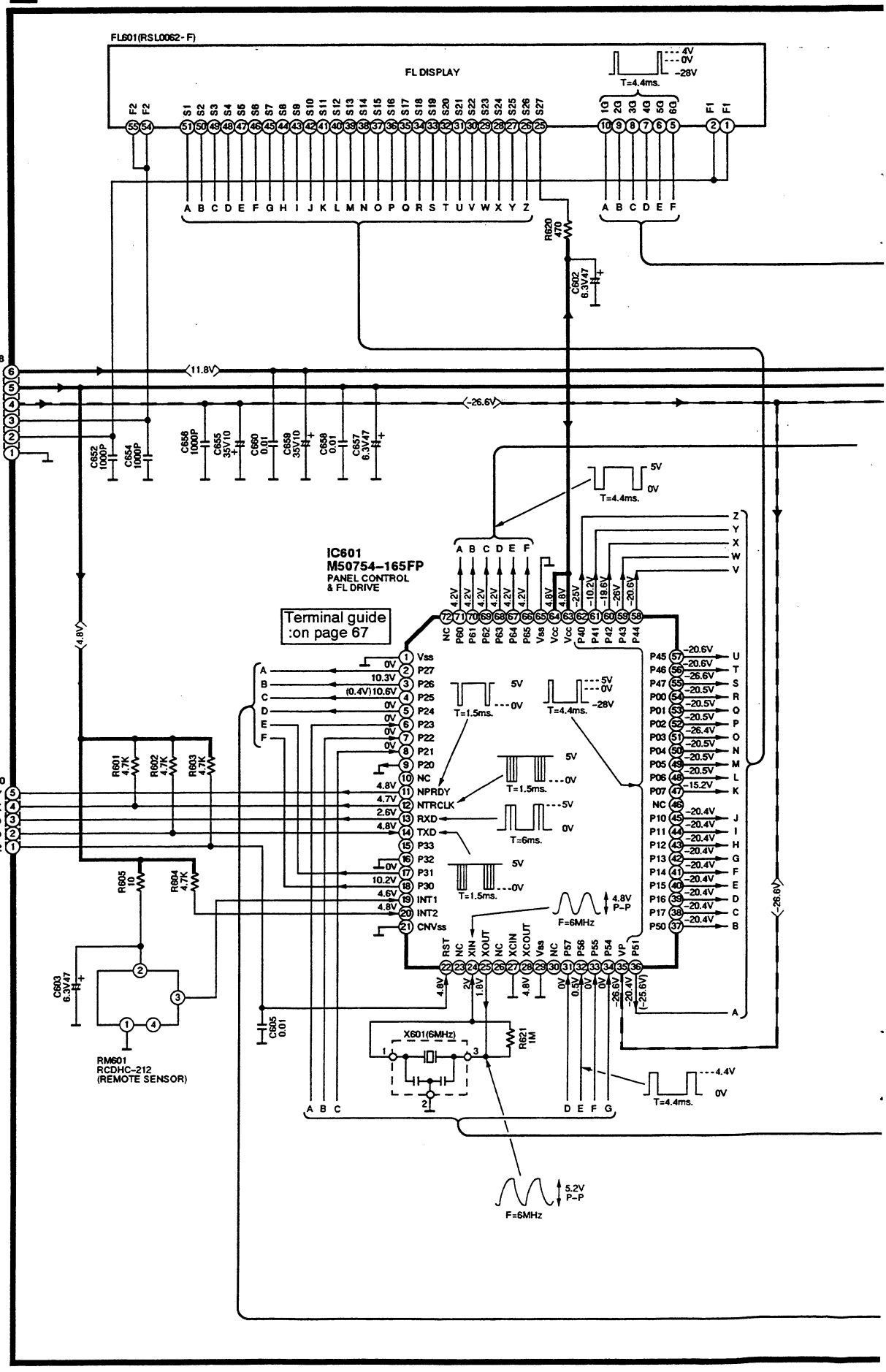


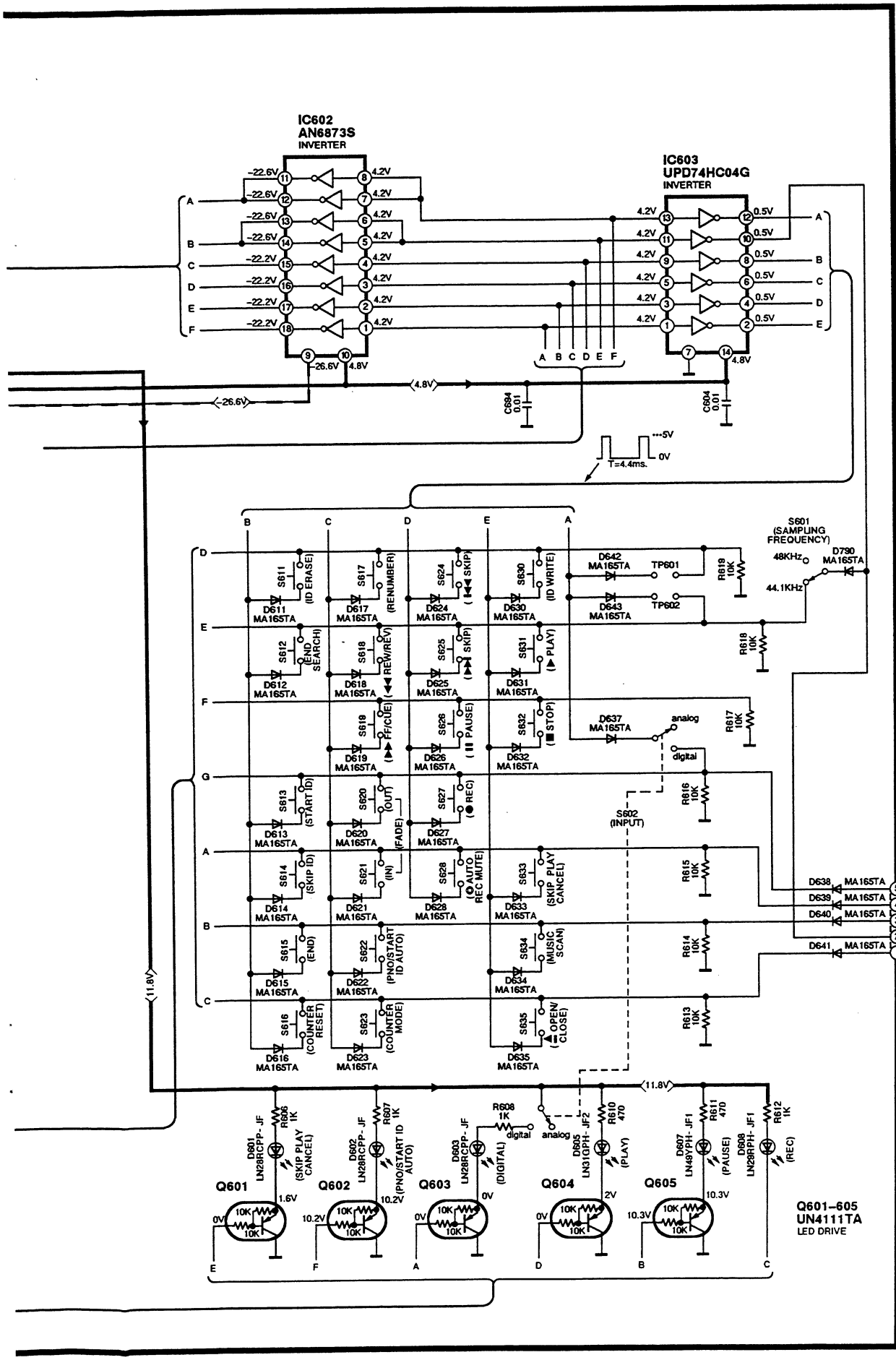
D RF CIRCUIT (P.C.Board : on page 51)




4.8V
IC102
AN7035SCE2
PLAYBACK PLL
Terminal guide : on pages 58,59.
SYNCIN VREF OPIN1 OPOUT1 OPIN2 OPOUT2 OPIN3 OPOUT3 GND2 SVSYNC DEMCOD PLLCP2 PLLCP1 Vcc2 VCOC2 VCOC1
LPF GND1 ENVC ENVR RFENV RSENVC RPRF DELOUT DELIN1 DELIN2 PDOUT VREF1 VCOV R/P VCOR Vcc1
TP101
ATF AMP GAIN ADJ.
PLL FREE RUN ADJ.
play
T=15ms.
T=30ms.
F=10MHz
CN45
D5
A.GND
PILOT
SYNC
H SW
To A SERVO CIRCUIT(CN45) on page 30.
CN42
RF GND
PBDT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
To M DIGITAL CIRCUIT(CN41) on page 47.

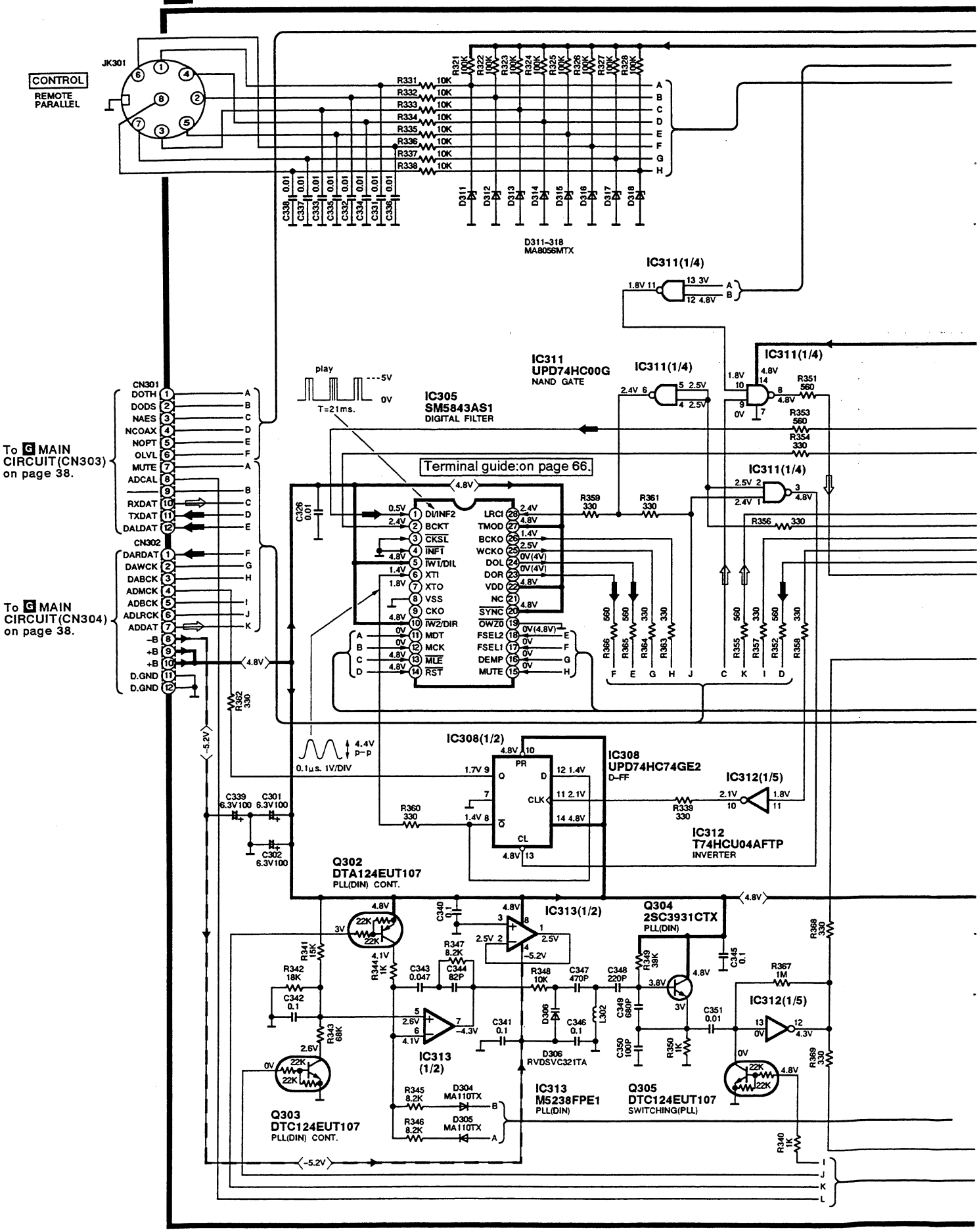
E OPERATION CIRCUIT (P.C.Board:on pages 54,55)

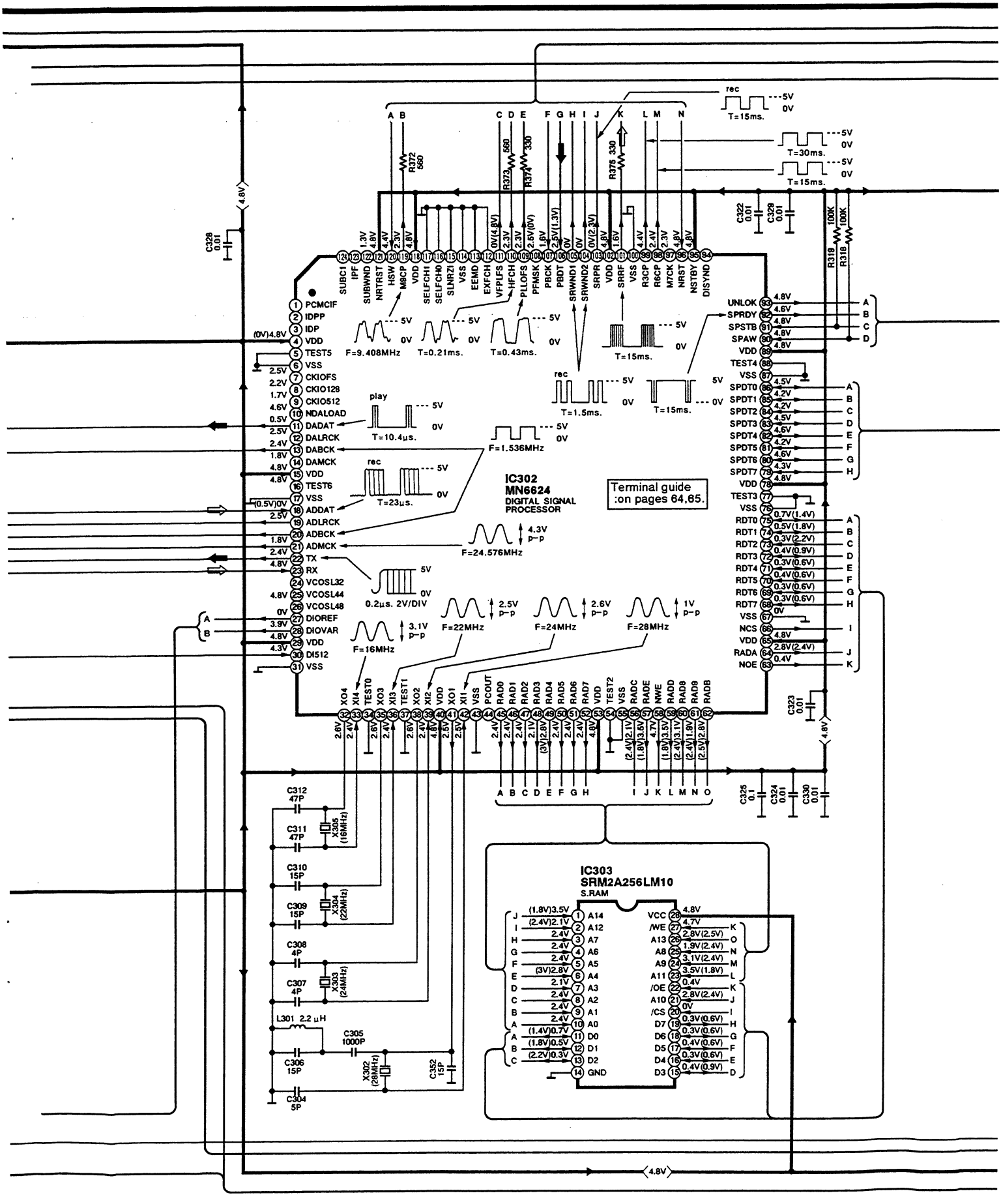




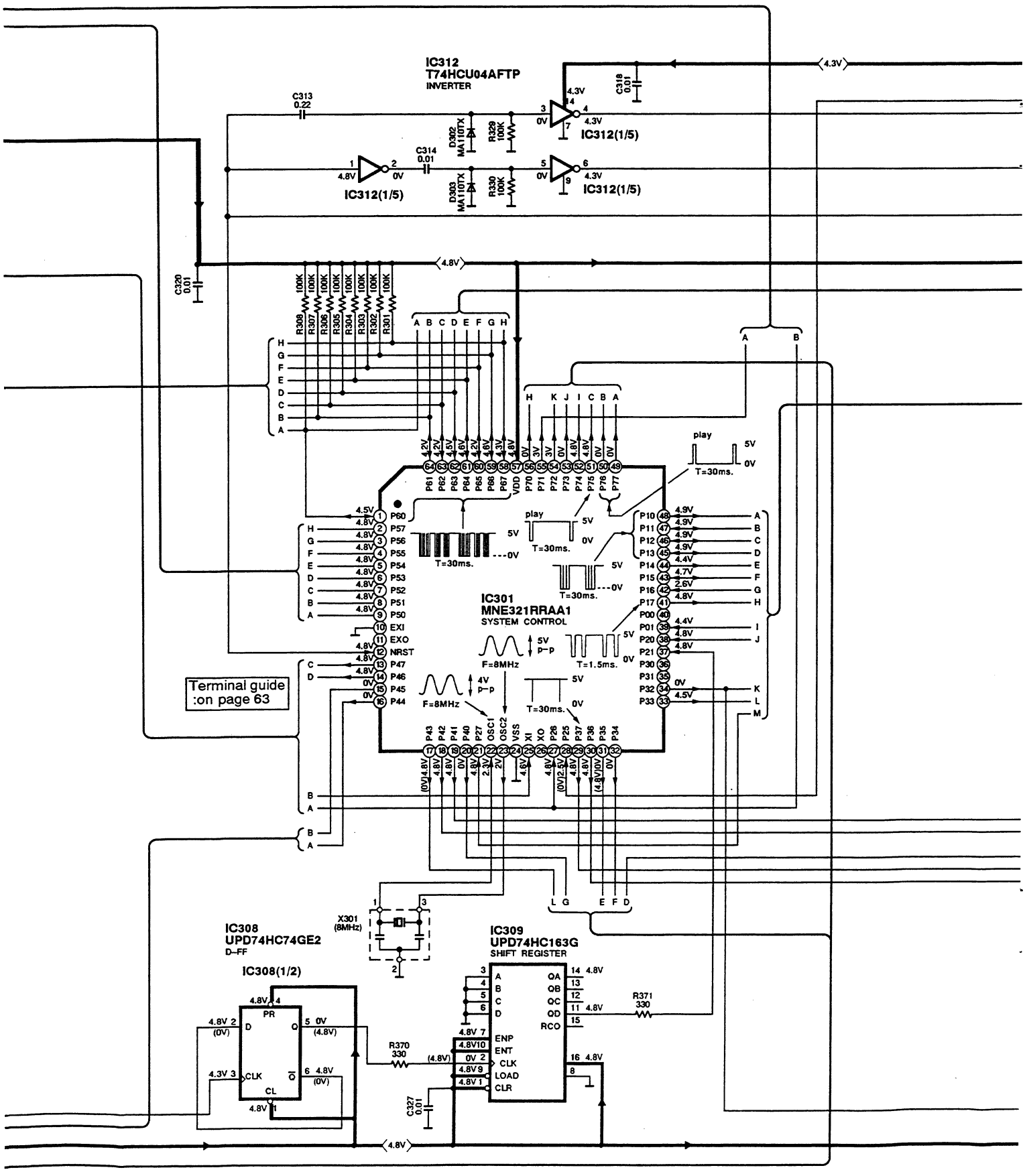
F SEARCH CIRCUIT
(P.C.Board:on page 55)

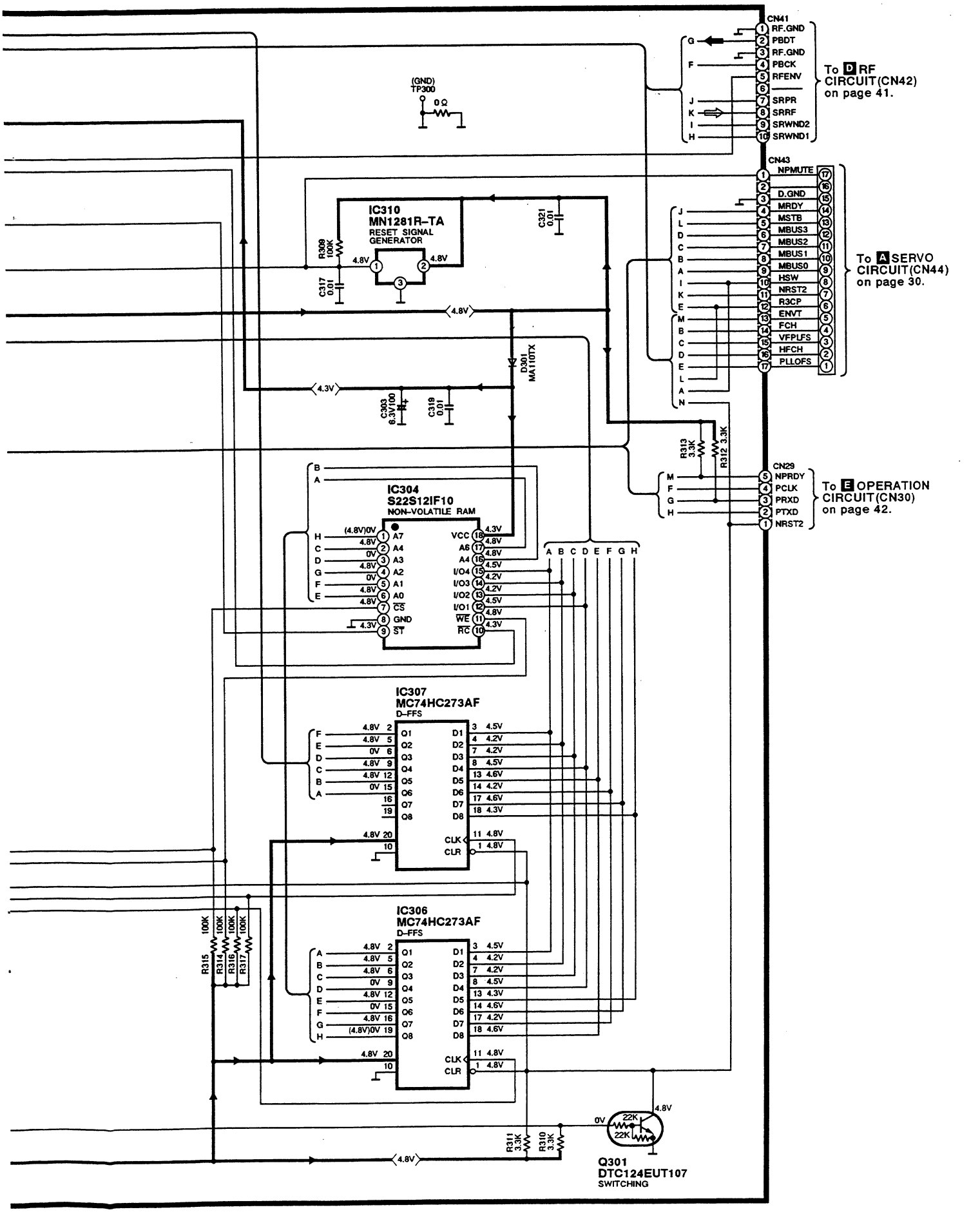
M DIGITAL CIRCUIT (P.C.Board:on page 52)



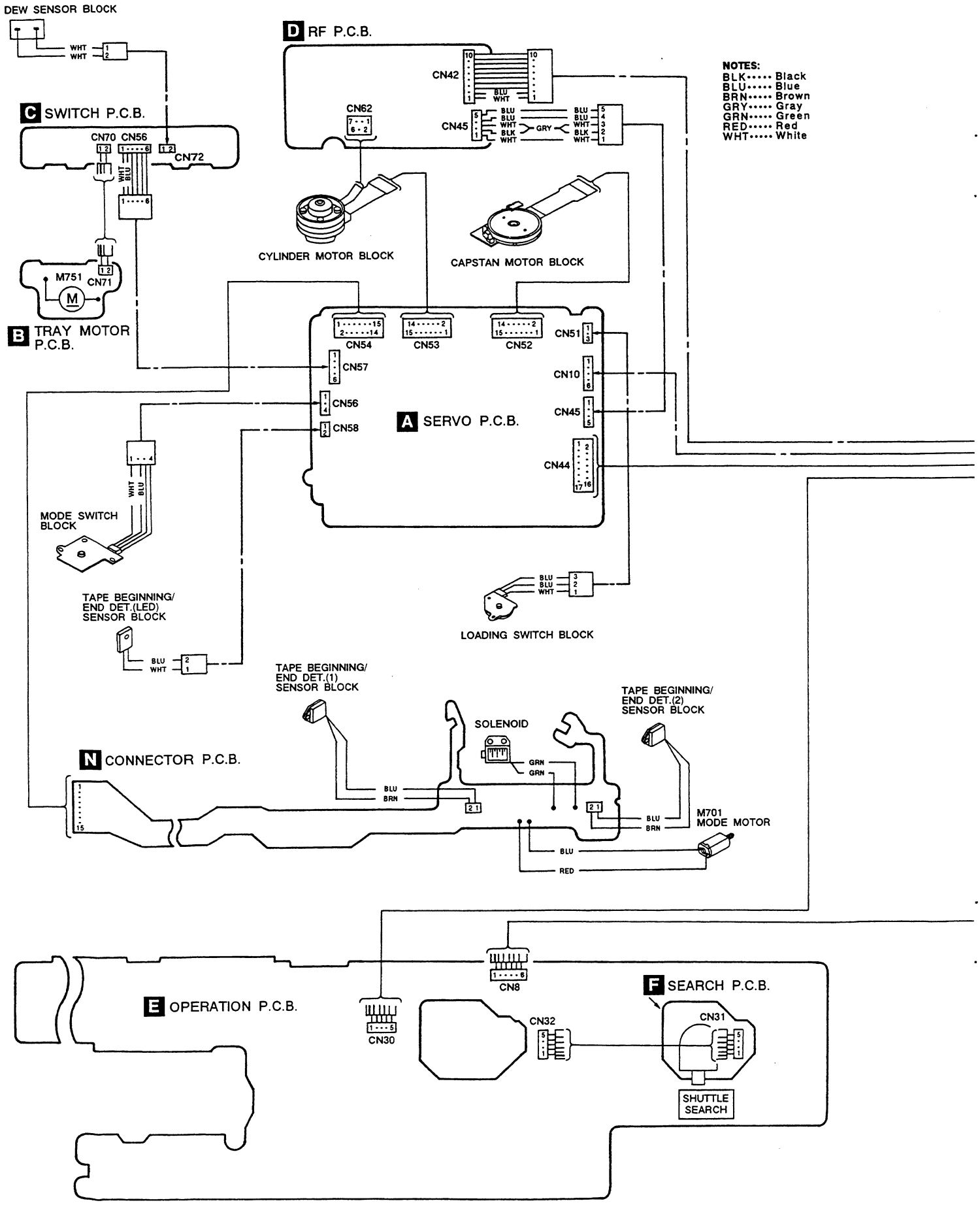

IC302
MN6624
DIGITAL SIGNAL
PROCESSOR
Terminal guide
:on pages 64,65.
IC303
SRM2A256LM10
S.RAM
F=9.408MHz
T=0.21ms.
T=0.43ms.
T=15ms.
T=1.5ms.
T=10.4µs.
F=1.536MHz
T=23µs.
F=24.576MHz
0.2µs. 2V/DIV
F=16MHz
F=22MHz
F=24MHz
F=28MHz
T=30ms.
X305 (16MHz)
X304 (22MHz)
X303 (24MHz)
X302 (28MHz)
L301 2.2 µH
C305 1000P
C312 47P
C311 47P
C310 15P
C309 15P
C308 4P
C307 4P
C306 15P
C304 5P
C352 15P
C322 0.01
C328 0.01
C323 0.01
C325 0.1
C324 0.01
C330 0.01
R319 100K
R318 100K
R372 560
R373 560
R374 330
R375 330

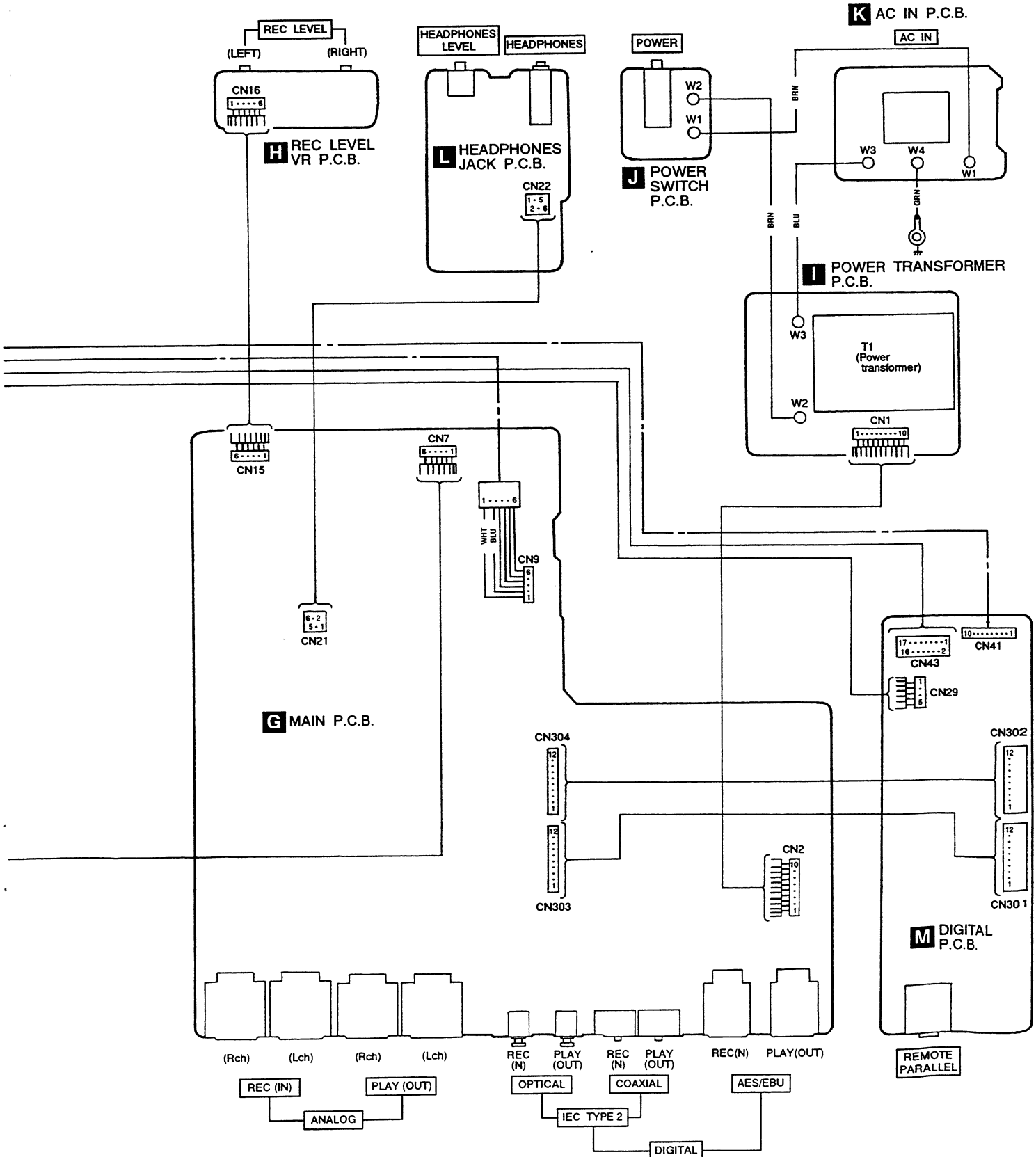
M DIGITAL CIRCUIT (P.C.Board:on page 52)




CN41
1 RF.GND
2 PBDT
3 RF.GND
4 PBCK
5 RFENV
6
7 SRPR
8 SRRF
9 SRWND2
10 SRWND1
To D RF CIRCUIT(CN42) on page 41.
CN43
1 NPMUTE
3 D.GND
4 MRDY
5 MSTB
6 MBUS3
7 MBUS2
8 MBUS1
9 MBUS0
10 HSW
11 NRST2
12 R3CP
13 ENVT
14 FCH
15 VFPLFS
16 HFCH
17 PLLOFS
To A SERVO CIRCUIT(CN44) on page 30.
CN29
5 NPRDY
4 PCLK
3 PRXD
2 PTXD
1 NRST2
To E OPERATION CIRCUIT(CN30) on page 42.
(GND) TP300
0Ω
IC310
MN1281R-TA
RESET SIGNAL GENERATOR
R309 100K
C317 0.01
C321 0.01
C303 6.3V100
C319 0.01
D301 MA110TX
4.8V
4.3V
R313 3.3K
R312 3.3K
IC304
S22S12IF10
NON-VOLATILE RAM
IC307
MC74HC273AF
D-FFS
IC306
MC74HC273AF
D-FFS
R315 100K
R314 100K
R316 100K
R317 100K
R311 3.3K
R310 3.3K
22K
22K
0V
Q301
DTC124EUT107
SWITCHING

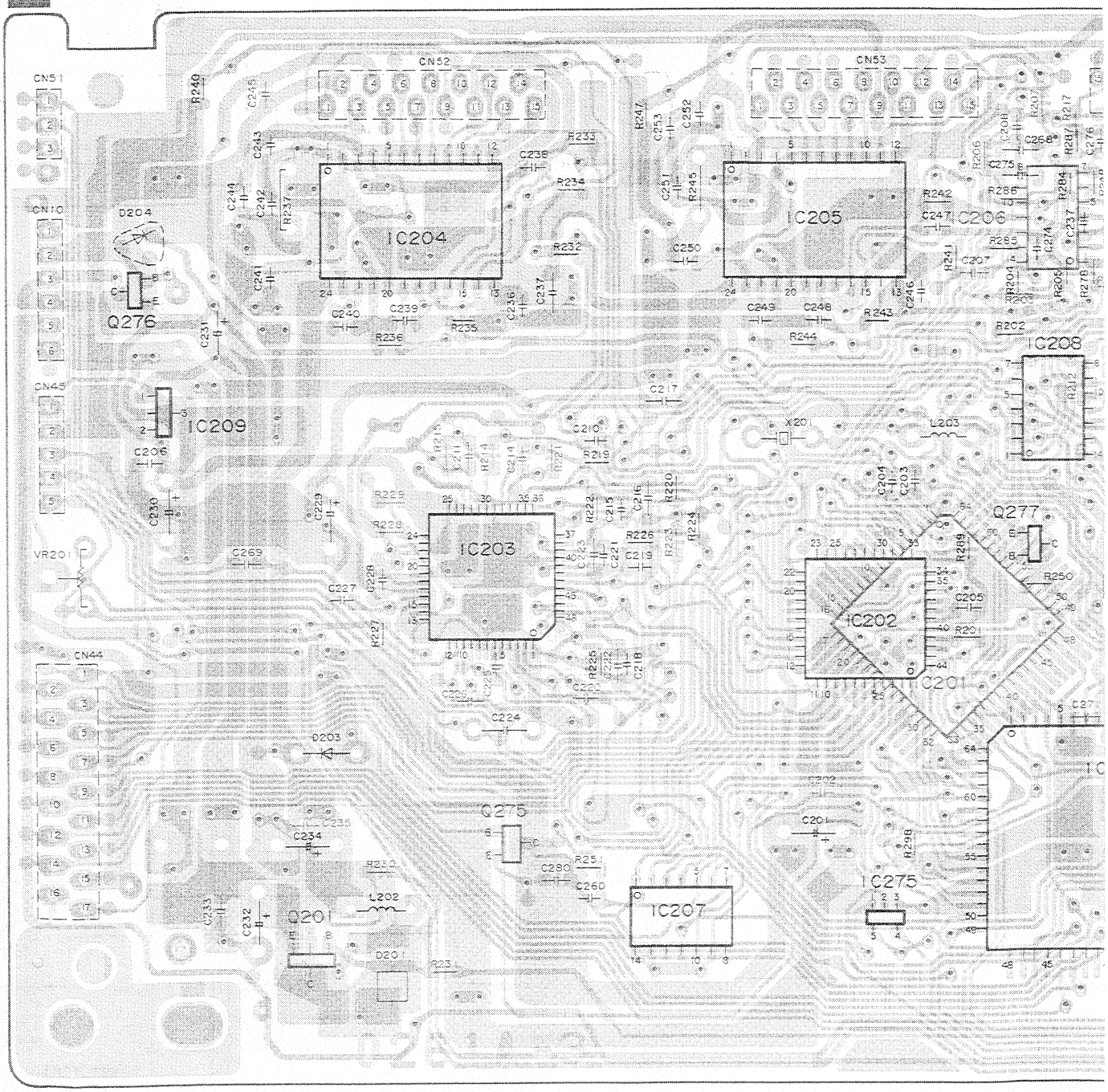
■WIRING CONNECTION DIAGRAM



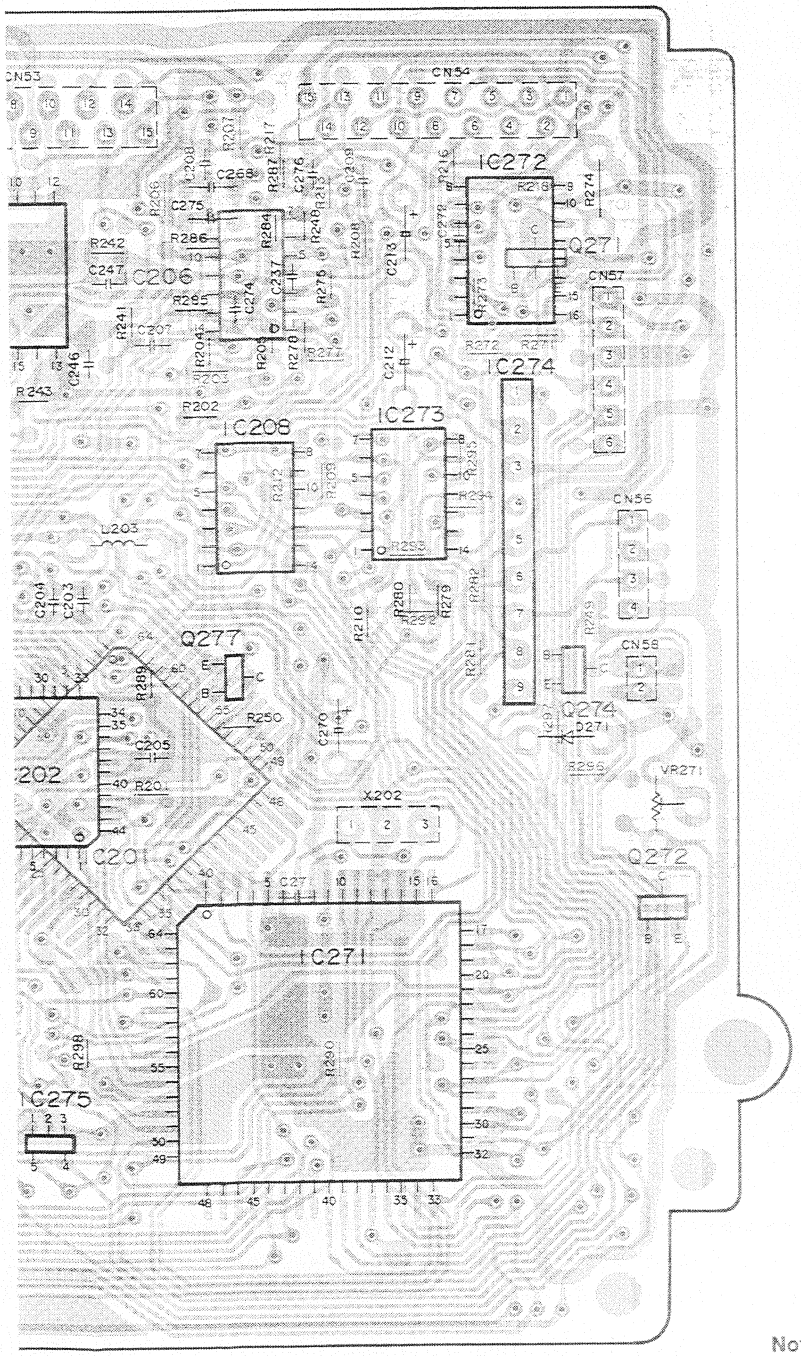

REC LEVEL
(LEFT)
(RIGHT)
CN16
H REC LEVEL VR P.C.B.
HEADPHONES LEVEL
HEADPHONES
L HEADPHONES JACK P.C.B.
CN22
POWER
W2
W1
J POWER SWITCH P.C.B.
K AC IN P.C.B.
AC IN
W3
W4
W1
BRN
GRN
BRN
BLU
I POWER TRANSFORMER P.C.B.
W3
T1 (Power transformer)
W2
CN1
CN15
CN7
CN9
WHT
BLU
CN21
G MAIN P.C.B.
CN43
CN41
CN29
CN304
CN303
CN2
CN302
CN301
M DIGITAL P.C.B.
REMOTE PARALLEL
(Rch)
(Lch)
(Rch)
(Lch)
REC (N)
PLAY (OUT)
REC (N)
PLAY (OUT)
REC(N)
PLAY(OUT)
REC (IN)
PLAY (OUT)
ANALOG
OPTICAL
COAXIAL
AES/EBU
IEC TYPE 2
DIGITAL

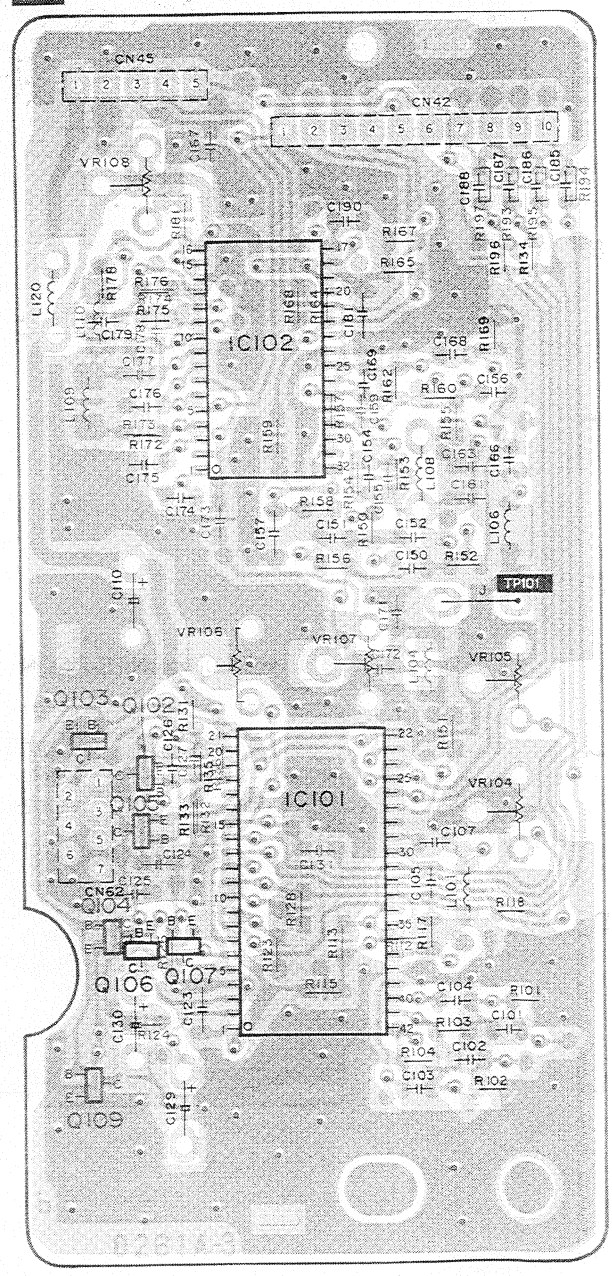
PRINTED CIRCUIT BOARDS

A SERVO P.C.B.



D RF P.C.B.

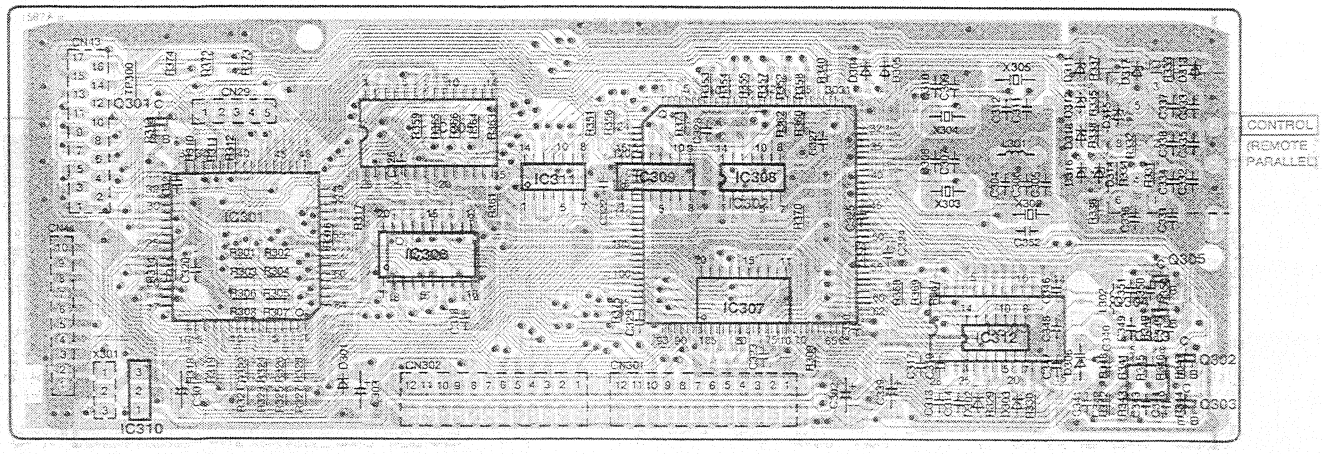




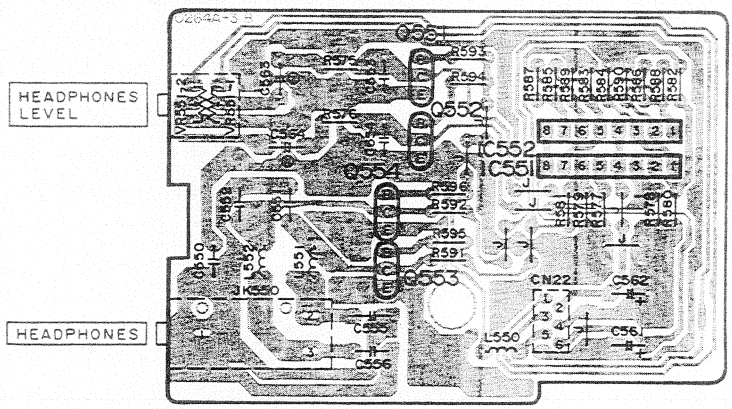
Notes:

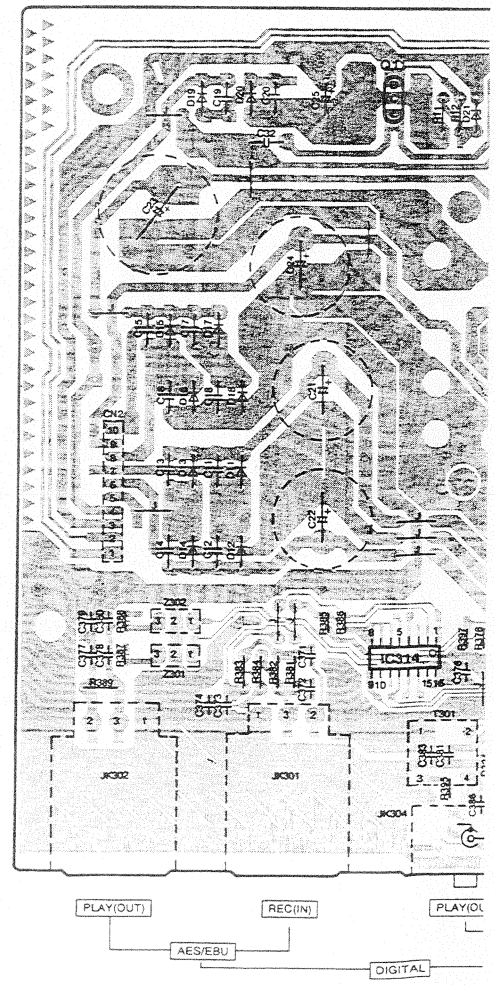
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black.
  The opposite side is printed in blue.
- The "●" mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

M DIGITAL P.C.B.



L HEADPHONES JACK P.C.B.



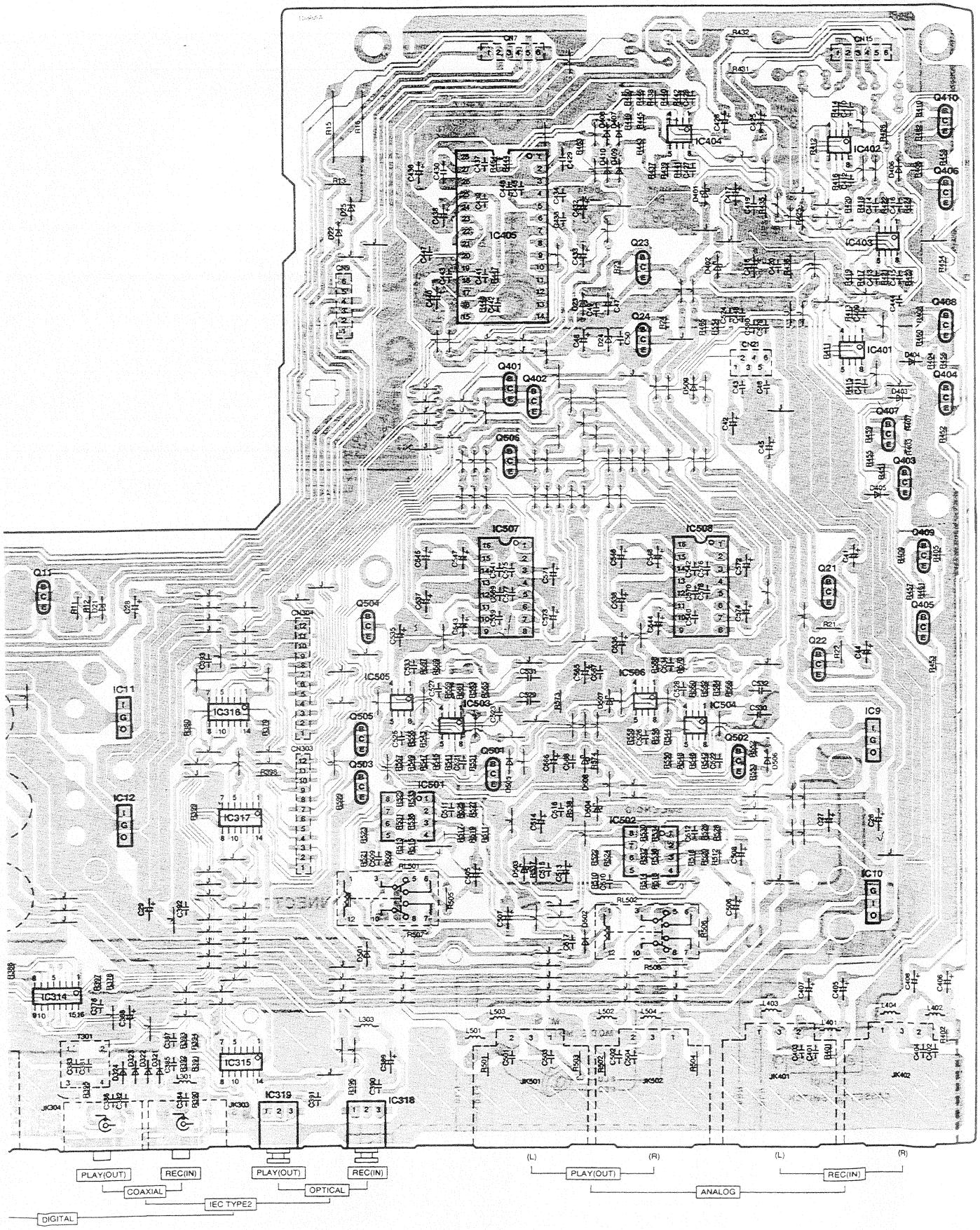


Notes:

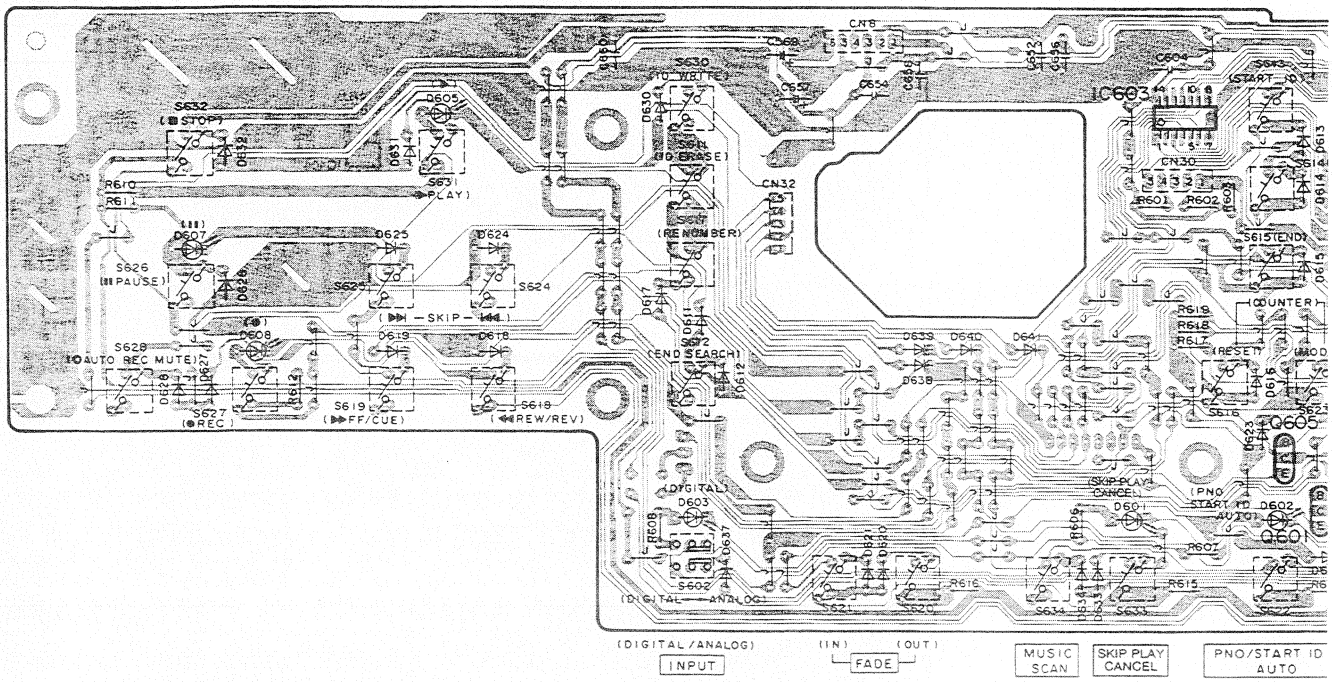
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black.
  The opposite side is printed in blue.
- The " ● " mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

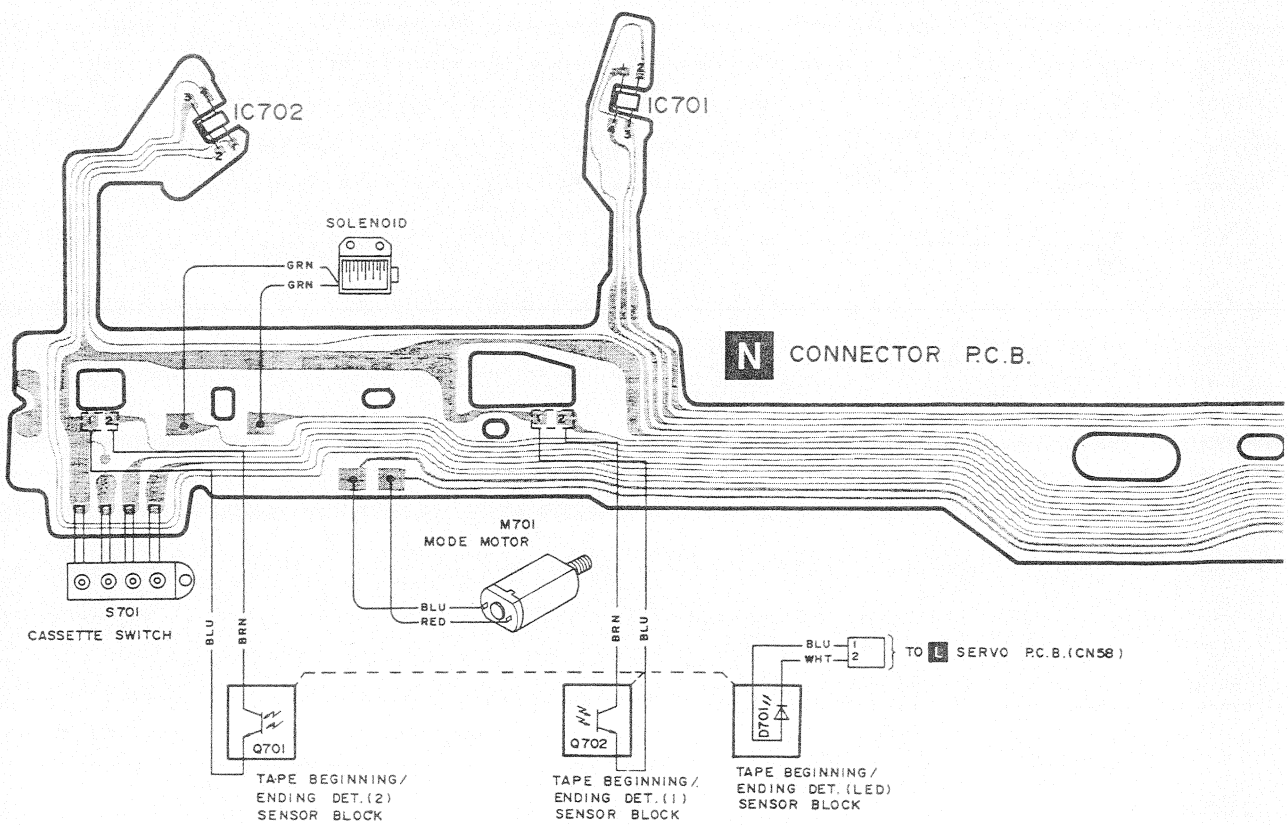
5 6 7 8

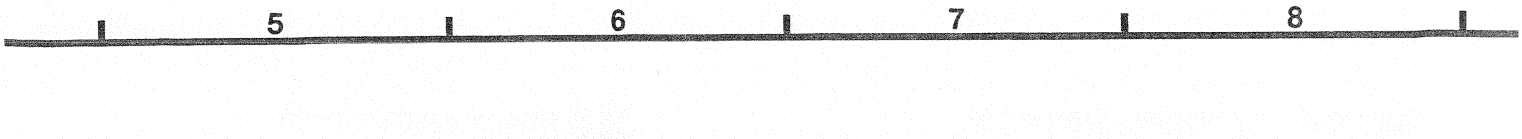
G MAIN P.C.B.

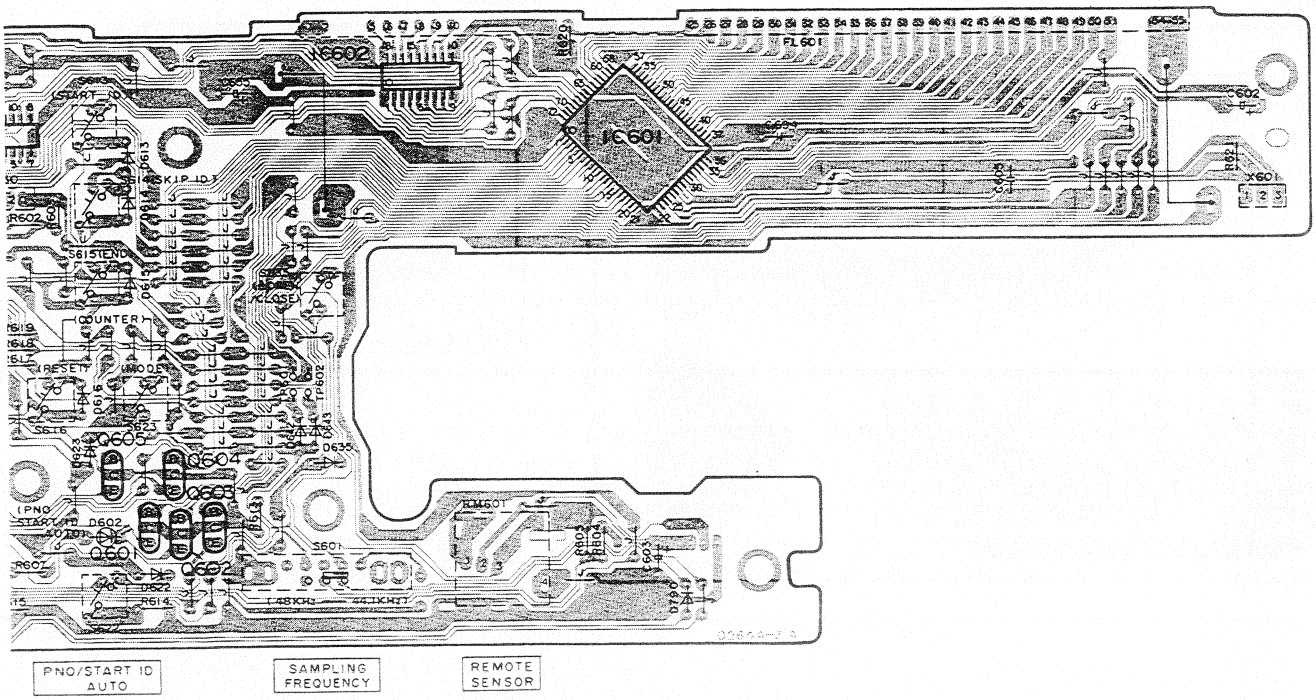


E OPERATION P.C.B.

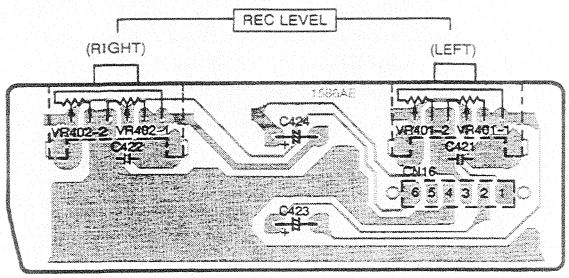




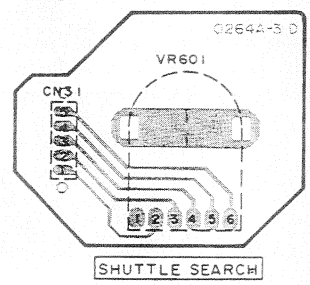


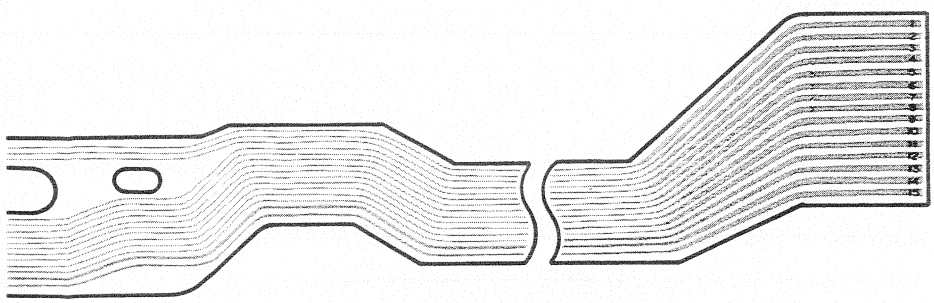


H REC LEVEL VR P.C.B.

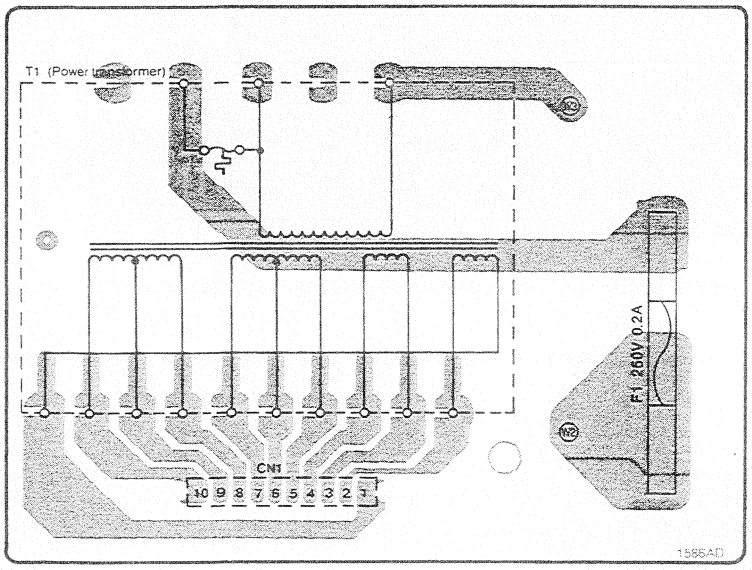


F SEARCH P.C.B.

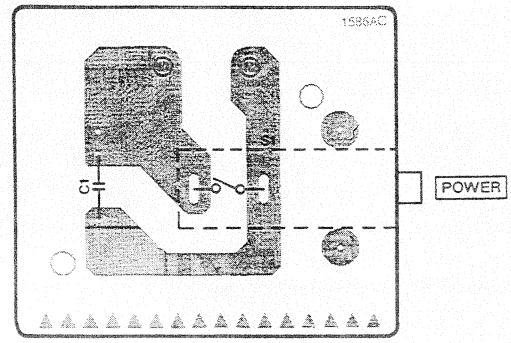




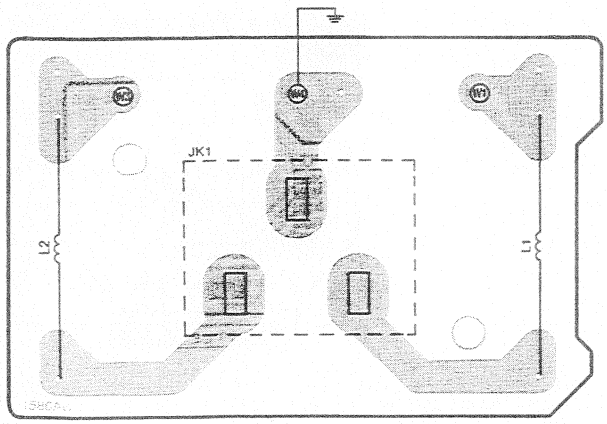
I POWER TRANSFORMER P.C.B.



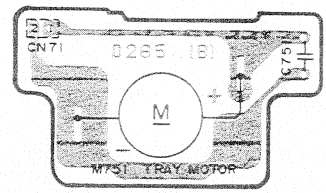
J POWER SWITCH P.C.B.



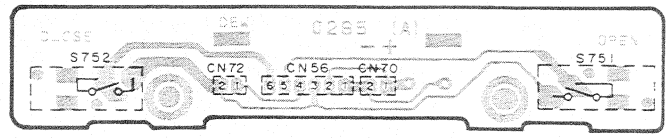
K AC IN P.C.B.



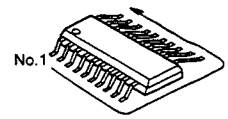
B TRAY MOTOR P.C.B.



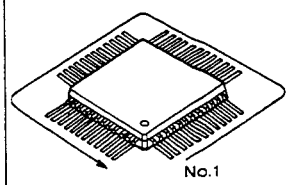
C SWITCH P.C.B.



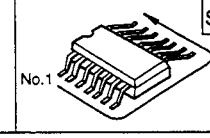
■TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



M5238FPE1	8PIN	MC74HC126AFR	14PIN	M5M34050FTP2	16PIN	MC74HC273AF	20PIN
NJM4580EDTE1	8PIN	MN4066BS-T2	14PIN	UPD74HC163G	16PIN	AN7035SCE2	32PIN
AN1339SE2	14PIN	UPD74HC00G	14PIN	AN6607NSE2	16PIN	AN7030SE2	42PIN
M5228FPE2	14PIN	UPD74HC04G	14PIN	AN6873S	18PIN		
MC74HC125AF	14PIN	UPD74HC04GE2	14PIN	S22S12IF10	18PIN		



MN53020SDQ	44PIN	M50754-165FP	72PIN
AN8320NFA	48PIN	MN6624	124PIN
MNE321RRAA1	64PIN		
MN17541SDN2	64PIN		
MN6742SDR	64PIN		



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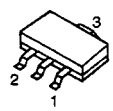
UPD74HC74GE2	14PIN
SM5843AS1	28PIN

AN78L05ME2



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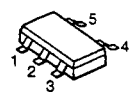

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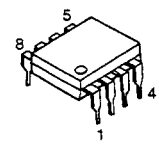
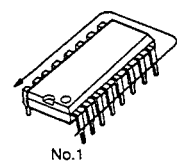
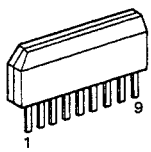




PCM1702P	16PIN
AK5339-VP	28PIN

TA7291S



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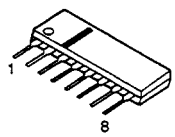

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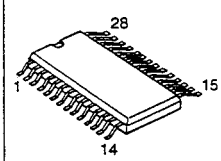

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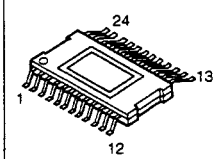

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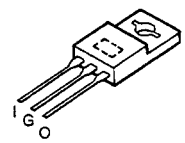

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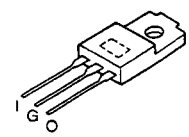

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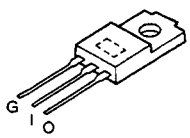

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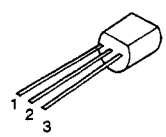

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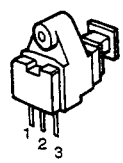

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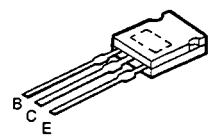

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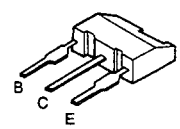

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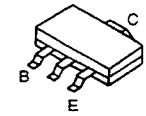

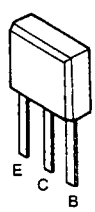

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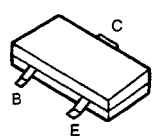
UN4112TA
UN4212TA



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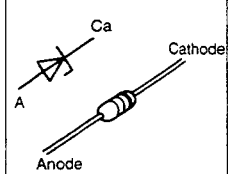

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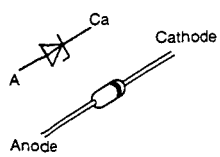

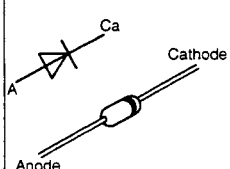

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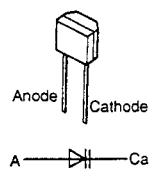
1SR35200TB
MA165TA

RVDSVC321TA



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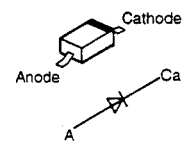

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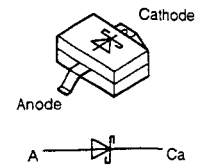

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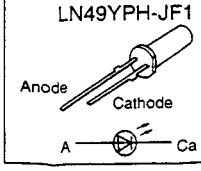
LN31GPH-JF2
LN49YPH-JF1



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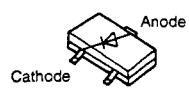

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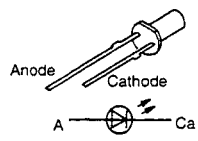

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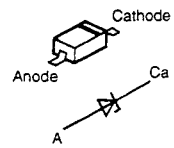

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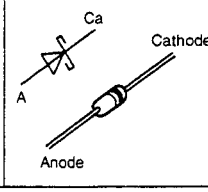

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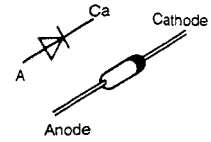


■ TERMINAL GUIDE

• IC101 (AN7030SE2): RF AMP.

Pin No.	Mark	I/O Division	Function
1	V_{CC} 1	I	Power supply terminal
2	ACH FB	O	Playback feed back signal (A ch)
3	ACH IN	I	Playback amp. signal (A ch)
4	GND 1	—	GND terminal
5	BCH IN	I	Playback amp. signal (B ch)
6	BCH FB	O	Playback feed back signal (B ch)
7	AREC PCM	I	RF recording level adj. terminal
8	AREC PLT		
9	AREC ATF		
10	BREC ATF		
11	BREC PLT		
12	BREC PCM		
13	REC CNT 1	I	Track pitch signal
14	REC CNT 2	I	ATF area det. signal
15	SRRF IN	I	Recording signal
16	GND 2	—	GND terminal
17	VREF	O	Reference voltage terminal (Not used, open)
18	AREC OUT	O	Recording signal (A ch)
19	BREC OUT	O	Recording signal (B ch)
20	BTL REC	O	Recording control signal
21	V_{CC} 2	I	Power supply terminal
22	REC ON	O	Recording drive terminal (REC: "H")

Pin No.	Mark	I/O Division	Function
23	PLAY ON	O	Playback drive terminal (PLAY: "H")
24	HSW	I	Head switching signal
25	AR/RSEL	I	Not used, connected to power supply
26	R/PSEL	I	Recording/playback select signal (REC: "H", PLAY: "L")
27	EQ OUT	O	Equalization signal
28	EQ IN 3	I	Equalization amp. signal
29	EQ IN 2		
30	EQ IN 1		
31	BF REQ	I	Equalization amplitude drive terminal (B ch)
32	B PHASE	I	Equalization phase drive terminal (B ch)
33	B GAIN	I	Equalization gain drive terminal (B ch)
34	AF REQ	I	Equalization amplitude drive terminal (A ch)
35	A PHASE	I	Equalization phase drive terminal (A ch)
36	A GAIN	I	Equalization gain drive terminal (A ch)
37	SV RF	O	Playback signal
38	GND 3	—	GND terminal
39	A INT	I	Playback amp. signal (A ch)
40	B INT	I	Playback amp. signal (B ch)
41	B INT IN	O	Playback amp. signal (B ch)
42	A INT IN	O	Playback amp. signal (A ch)

• IC102 (AN7035SCE2): Playback PLL

Pin No.	Mark	I/O Division	Function
1	LPF	O	Buffer amp. 1 reference terminal
2	GND 1	—	GND terminal
3	ENVC	O	ENV time constant setting terminal
4	ENVR	I	ENV threshold voltage adj. terminal
5	RSENV	O	RF envelope signal
6	RSENVC	O	RSENV time constant setting terminal
7	RSRF	I	RF signal

Pin No.	Mark	I/O Division	Function
8	DELOUT	O	RF signal
9	DELIN 1	I	Delay (45°) signal
10	DELIN 2	I	Delay (90°) signal
11	PDOUT	O	Phase comparator signal
12	VREF 1	I	V/I converter reference voltage terminal
13	VCOV	I	OSC frequency control terminal
14	R/P	I	Recording/playback select terminal (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
15	VCOR	I	OSC frequency adj. terminal
16	V_{CC} 1	I	Power supply terminal
17	VCOC 1	O	VCO terminal
18	VCOC 2	O	VCO terminal
19	V_{CC} 2	I	Power supply terminal
20	PLL CP 1	O	Clock (2 CK) signal (Not used, open)
21	PLL CP 2	O	Clock (CK) signal
22	DEMCOD	O	NRZI demodulated signal for playback signal with PLL
23	SVSYNC	O	ATF sync. signal

Pin No.	Mark	I/O Division	Function
24	GND 2	—	GND terminal
25	OP OUT 3	O	ATF 3 signal
26	OP IN 3	I	ATF 3 signal
27	OP OUT 2	O	ATF 2 signal
28	OP IN 2	I	ATF 2 signal
29	OP OUT 1	O	ATF 1 signal
30	OP IN 1	I	ATF 1 signal
31	VREF	I	Reference voltage terminal
32	SYNC IN	I	ATF sync. det. terminal

• IC201 (MN6742SDR): Servo processor

Pin No.	Mark	I/O Division	Function
1	OP10A	O	Cylinder rotative stop signal
2	SCK	I	Serial clock signal
3	SDA	I/O	Serial data signal
4	OSC 1	I	System clock (8 MHz) signal
5	OSC 2	O	
6	NRST	I	Reset signal
7	NC	—	Not connection
8	OP20A	O	SSP ready signal
9	NC	—	Not connection
10	V_{SS}	—	GND terminal
11	VHS	—	Not used, open
12	OP 101	O	CAPFG/RLFGT select signal
13	TP 2	O	R3CP/RLFGT select signal
14	TP 3	I	PLL off-set/parallel data signal
15	TP 4		
16	TP 5		
17	TP 6		
18	TP 7	I	PLL off-set/data effective flag terminal
19	TP 8	I	Not used, connected to power supply
20	MOS	I	Serial port/strobe signal
21	TST	—	Test mode terminal (Normal, connected to GND)
22	ENC	—	Connected to GND terminal

Pin No.	Mark	I/O Division	Function
23	NC	—	Not connection
24	NC		
25	V_{DD}	I	Power supply terminal
26	NC	—	Not connection
27	RSW	—	Not used, open
28	HAS	O	A/D input select signal (Not used, open)
29	AVM	—	Not used, connected to GND
30	VLP	—	Not used, open
31	STM	I	R3TU or RLFGT (64 P/R) signal
32	STR	I	Comparator reference signal of STM input
33	CAE	O	Capstan velocity control signal
34	CYE	O	Cylinder velocity control signal
35	END	I	VREF or ATFTER voltage signal
36	VSY	I	$\overline{\text{CYLPG}}$ signal
37	ASH 1	I	Capstan FG or RLFGT signal after EXOR
38	NC	—	Not connection
39	AFB 1	O	Inverter amp. signal of ATFTER input (Not used, open)
40	NC	—	Not connection
41	AFG 1	I	ATF tracking error voltage terminal
42	ASH 2	O	Not used, connected to GND
43	AFB 2	—	Not used, open
44	NC	—	Not connection

Pin No.	Mark	I/O Division	Function
45	AFG 2	I	Reference voltage terminal
46	VDA	I	Power supply terminal
47	VSA	—	GND terminal
48	ORE	O	Reference voltage terminal
49	IRE	I	
50	GND	—	GND terminal
51	IPL	O	Not used, open
52	NC	—	Not connection
53	CLP	I	Not used, connected to GND
54	CP 1	O	Not used, open
55	CP 2	I	Supply reel FG signal
56	NC	—	Not connection
57	NC		
58	CN 1	O	Not used, open
59	CN 2	I	Not used, connected to GND
60	CTL	O	Not used, open
61	PFG	I	Cylinder FG signal
62	PGM	I	Not used, connected to GND
63	CUL	O	Capstan rotative direction signal
64	NC	—	Not connection

• IC202 (MN53020SDQ): ATF

Pin No.	Mark	I/O Division	Function
1	NSNC	O	SYNC det. monitor terminal
2	SVAL	I	ATF select terminal
3	PCMOK	I	PCM playback monitor terminal
4	SPE	O	Starting pulse of counter track lock
5	SP 2	O	Sampling pulse signal for pilot signal of adjacent track
6	SP 1		
7	DCYLPG	I	Cylinder PG signal
8	DCAPFG 1	I	Capstan FG signal
9	DCAPFG 2		
10	DRLFGT	I	Take-up reel FG signal
11	DCYLFG	I	Cylinder FG signal
12	SYNC	I	ATF sync. det. terminal
13	NRST	I	Reset signal
14	R3CP	I	Timing signal for RF envelope signal control
15	ENVT		
16	FCH	I	System clock signal (9.408 MHz)
17	V_{DD}	I	Power supply terminal
18	V_{SS}	—	GND terminal
19	MODE 1	I	SYNC det. select terminal (Not used, connected to GND)
20	HFCH	I	Clock signal for PLL off-set data
21	PLLOFS	I	PLL off-set data signal
22	TEST 6	—	Not used, connected to GND
23	P MODE	I	Pulse width select terminal (Not used, open)
24 ∫ 28	TEST 1 ∫ TEST 5	I	Test terminal (Not used, connected to GND)
29	SPHT	—	Not used, open
30	HSWS	O	Head switching signal (33.33 Hz)
31	HSWR		
32	SEL A	I	CAPFGTU signal select terminal
33	SEL B	I	R3TU signal select terminal
34	PLL 0	O	Output signal after decoded 4 bit parallel data of PLLOFS
35	PLL 1		
36	PLL 2		
37	PLL 3		
38	MODE 2	—	Not used, open
39	V_{SS} 2	—	GND terminal
40	V_{DD} 2	I	Power supply terminal
41	R3TU	O	Building-up edge signal of R3CP/DRLFGT
42	CAPFGTU	O	Capstan FG signal/Take-up reel FG signal
43	CAPER	O	Capstan rotative direction control signal
44	NLNR	O	Track linearity monitor terminal

• IC203 (AN8320NFA): Linear servo

Pin No.	Mark	I/O Division	Function
1	FG1 AO	O	Capstan FG signal
2	FG1 AI	I	Capstan FG (—) signal
3	FG1 FI	I	Frequency characteristic setting terminal
4	CYL PG	O	Cylinder PG signal
5	PGVR	I	PG delay time adj. terminal
6	CYPGI	I	PG schmidt comparator terminal
7	GND	—	GND terminal
8	SVRF	I	ATF terminal
9	CPD	I	Det. capacity connection terminal
10	CCI	O	Full-wave rectification buffer terminal
11	CCO	I	Clamp circuit terminal
12	SP 1	I	SP 1 terminal
13	SP 2	I	SP 2 terminal
14	VSPE	I	SPE setting terminal
15	SPE	I	SPE terminal
16	CSH	I	Hold capacity connection terminal
17	ATFTER	O	ATF control command signal
18	CFB	—	Phase compensation terminal
19	V_{CC}	I	Power supply terminal
20	ATFON	I	ATF ON terminal (Not used, connected to power supply)
21	PTBIA	—	Photo-transistor bias terminal (Not used, open)
22	VREF	O	Reference voltage terminal
23	LEDR 1	I	Bias voltage terminal
24	LEDH 1	—	Constant current terminal (Not used, open)
25	LEDR 2	I	Bias voltage terminal
26	LEDH 2	—	Constant current terminal (Not used, open)
27	CYL FG	O	Cylinder FG signal
28	CYF GSI	I	Cylinder schmidt comparator terminal
29	CYF GAO	O	Cylinder op. amp. terminal
30	CYF GAI	I	Cylinder op. amp. (—) terminal
31	NST BY	I	STAND BY signal (Not used, connected to power supply)
32	TF GAI	I	Take-up reel op. amp. (—) terminal
33	TF GAO	I	Take-up reel op. amp. terminal
34	TF GSI	I	Take-up reel schmidt comparator terminal
35	RLFGT	O	Take-up reel FG signal
36	RLFGS	O	Supply reel FG signal
37	SF GSI	I	Supply reel schmidt comparator terminal
38	SF GAO	O	Supply reel op. amp. terminal
39	SF GAI	I	Supply reel op. amp. terminal
40	V_{CC}	I	Power supply terminal
41	FG 2FI	—	Frequency characteristic setting terminal
42	FG 2AI	I	Capstan FG (—) signal
43	FG 2AO	O	Capstan FG signal
44	FG 2SI	I	Capstan FG schmidt comparator terminal
45	CPFG 2	O	Capstan FG signal
46	FILSLD	I	Frequency characteristic $\overline{\text{DOWN}}$ terminal
47	CPFG 1	O	Capstan FG signal
48	FG 1SI	I	Capstan FG schmidt comparator terminal

• IC271 (MN17541SDN2): Mechanism control

Pin No.	Mark	I/O Division	Function
1	NSBOA	O	Serial data signal
2	NRST	I	Reset signal
3	NSYNC	—	Not used, open
4	X 2		
5	X 1		
6	V_{SS}	—	GND terminal
7	OSC 2	O	Clock signal (8MHz)
8	OSC 1	I	
9	V_{DD}	I	Power supply terminal
10	NTC1B	I	Supply reel FG signal

Pin No.	Mark	I/O Division	Function
11	NIRQ 0	I	Take-up reel FG signal
12	NIRQ 1	I	Transfer strobe signal of system control
13	P 00 (MSTB)		
14	P 01 (MRDY)	O	Transfer ready signal of system control
15	P 02 (NSSTB)	O	Transfer strobe signal
16	P 03 (NSRDY)	I	Transfer ready signal
17	P 10 (ATFGT)	O	ATF gain (× 1/2) select terminal
18	P 11 (REWGT)	O	REW FG · PG gain select terminal
19	P 12 (LPMOD)	—	Not used, open
20	P 13 (MODMT0)	O	Mode motor control signal
21	P 20 (MODMT1)		
22	P 21 (MODMT2)		
23	P 22	—	Not used, open
24	P 23 (PLG)	O	Plunger control signal
25	P 30	—	Not used, open
26	P 31		
27	P 32 (LOAD 1)	O	Tray motor control (+) terminal
28	P 33 (LOAD 2)	O	Tray motor control (−) terminal
29	P 40	—	Not used, open
30	P 41 (DEW)	I	Dew sensor det. signal
31	P 42 (EOT)	I	Tape end det. signal
32	P 43 (BOT)	I	Tape begin det. signal
33	P 50 (OPEN)	I	Cassette open det. signal
34	P 51 (CLOSE)	I	Cassette close det. signal
35	P 52 (LOAD S)	I	Loading start det. signal
36	P 53 (LOAD E)	I	Loading stop det. signal

Pin No.	Mark	I/O Division	Function
37	P 60 (SW 2)	O	Test terminal
38 ∫ 40	P 61 (MMOD 0) ∫ P 63 (MMOD 2)	I	Tape mode det. signal
41 ∫ 44	P 70 (MBUS 0) ∫ P 73 (MBUS 3)	I/O	Transfer bus terminal of system control
45	P 80 (RCC)	—	Not used, open
46	P 81 (FIL)	O	FILTER select signal
47	P82 (ATFON)	—	Not used, open
48	P 83 (NSTBY)	—	Not used, open
49	P 90 (NSRST)	O	Reset signal
50	P 91 (LEDDRV)	O	Tape begin/end LED control signal
51	P 92 (PCMOK)	I	PCM playback det. signal
52	P 93 (SVAL 0)	I	ATF effective position setting terminal
53	NEXPS	I	Not used, connected to power supply
54	PA 0 (NSNCOK)	I	ATF sync. det. terminal
55	PA 1 (NLNOK)	I	Track linearity det. terminal
56	PA 2 (CAPER)	I	Capstan rotative direction command signal
57	PA 3	—	Not used, open
58	PB 0 (TH 1)	I	Tape hall det. signal
59	PB 1 (TH 2)		
60	NSBTB	I	Muting det. signal
61	NSBIB	I	Test terminal (Not used, open)
62	NSBOB		
63	NSBTA (SCLK)	I	Serial transfer clock signal
64	NSBIA (SDAT)	I/O	Serial transfer data signal

• IC301 (MNE321RRAA1): System control

Pin No.	Mark	I/O Division	Function
1	P60	I/O	Address and data bus terminal.
2 ∫ 9	P57 ∫ P50	I	8-pin parallel input terminals of remote control operation.
10	EXI	—	Not used, connected to GND.
11	EXO	—	Not used, open.
12	NRST	I	Reset signal input ("L": reset)
13	P47	O	Signal processor strobe signal.
14	P46	O	Signal processor address setting terminal.
15	P45	—	Not used, open.
16	P44	O	Muting signal.
17	P43	O	Reset signal.
18	P42	O	Write enable terminal.
19	P41	O	Chip select terminal.
20	P40	O	Digital de-emphasis ON/OFF terminal. ("H": ON)
21	P27	I	Ready signal.
22	OSC 1	I	Crystal OSC terminal. (8MHz)
23	OSC 2	O	
24	Vss	—	GND terminal.
25	XI	I	Data transfer command signal.
26	XO	—	Not used, open.
27	P26	I	PLL unlock signal.
28	P25	I	RF envelope signal.
29	P37	O	Clock signal of D-FFS.
30	P36	O	Clock signal of D-FFS.
31	P35	O	De-emphasis filler select terminal.
32	P34		
33	P33	O	Transfer strobe signal of mechanism control.
34	P32	O	Reset signal of mechanism control.
35	P31	—	Not used, open.
36	P30		
37	P21	I	PLL control signal.
38	P20	I	Transfer ready signal of mechanism control.
39	P01	I	Head switching signal. (33.33Hz)
40	P00	—	Not used, open.
41	P17	O	Serial data reception signal.
42	P16	I	Serial data transmission signal.
43	P15	I/O	Serial clock signal.
44	P14	O	Timing signal for RF envelope signal control.
45	P13	I/O	Transfer bus terminal for mechanism control
46	P12		
47	P11		
48	P10		
49	P77	O	Attenuation command serial data output terminal.
50	P76	O	Attenuation command bit clock output terminal.
51	P75	O	Attenuation command latch clock output terminal.
52	P74	O	PLL control terminal.
53	P73		
54	P72		
55	P71	O	Digital signal.
56	P70	O	Muting control terminal ("H": Mute)
57	V_{DD}	I	Power supply terminal.
58 ∫ 64	P67 ∫ P61	I/O	Address and data bus terminal.

• IC302 (MN6624): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	PCMCIF	O	Flag counter terminal
2	IDPP		
3	IDP	O	Test terminal
4	V_{DD}	I	Power supply terminal
5	TEST5	—	Not used, connected to GND
6	V_{SS}	—	GND terminal
7	CKIO FS	—	Not used, open
8	CKIO 128	O	Test terminal (Not used, open)
9	CKIO 512	—	Not used, open
10	NDALOAD	—	Not used, open
11	DADAT	O	DA data signal
12	DALRCK	O	LR discrimination signal (Not used, open)
13	DABCK	O	Serial bit clock signal
14	DAMCK	—	Not used, open
15	V_{DD}	I	Power supply terminal
16	TEST 6	—	Not used, open
17	V_{SS}	—	GND terminal
18	ADDAT	I	AD data signal
19	ADLRCK	O	LR discrimination signal
20	ADBCK	O	Serial bit clock signal
21	ADMCK	O	External clock signal
22	TX	O	Digital signal
23	RX	I	
24	VCOS L32	—	Not used, open
25	VCOS L44		
26	VCOS L48		
27	DIO REF	O	Digital signal (PLL control)
28	DIO VAR	O	
29	V_{DD}	I	Power supply terminal
30	DI 512	I	Digital signal (512 FS)
31	V_{SS}	—	GND terminal
32	XO 4	O	Crystal terminal (32 kHz×512)
33	XI 4	I	

Pin No.	Mark	I/O Division	Function
34	TEST 0	—	Not used, connected to GND
35	XO 3	O	Crystal terminal (44.1 kHz×512)
36	XI 3	I	
37	TEST 1	—	Not used, connected to GND
38	XO 2	O	Crystal terminal (48 kHz×512)
39	XI 2	I	
40	V_{DD}	I	Power supply terminal
41	XO 1	O	Crystal terminal (28 MHz)
42	XI 1	I	
43	V_{SS}	—	GND terminal
44	PC OUT	—	Not used, open
45	RAD 0	O	RAM address bus terminal
46	RAD 1		
47	RAD 2		
48	RAD 3		
49	RAD 4		
50	RAD 5		
51	RAD 6		
52	RAD 7		
53	V_{DD}	I	Power supply terminal
54	TEST 2	—	Not used, connected to GND
55	V_{SS}	—	GND terminal
56	RAD C	O	RAM address bus terminal
57	RAD E		
58	NWE	O	Write enable for memory
59	RAD D	O	RAM address bus terminal
60	RAD 8		
61	RAD 9		
62	RAD B		
63	NOE	O	Output enable for memory
64	RAD A	O	RAM address bus terminal
65	V_{DD}	I	Power supply terminal
66	NCS	O	Chip select terminal for memory

Pin No.	Mark	I/O Division	Function
67	V_{SS}	—	GND terminal
68	RDT 7	I/O	RAM data bus terminal
69	RDT 6		
70	RDT 5		
71	RDT 4		
72	RDT 3		
73	RDT 2		
74	RDT 1		
75	RDT 0		
76	V_{SS}	—	GND terminal
77	TEST 3	—	Not used, connected to GND
78	V_{DD}	I	Power supply terminal
79	SPDT 7	I/O	Address and data bus terminal
80	SPDT 6		
81	SPDT 5		
82	SPDT 4		
83	SPDT 3		
84	SPDT 2		
85	SPDT 1		
86	SPDT 0		
87	V_{SS}	—	GND terminal
88	TEST 4	—	Not used, connected to GND
89	V_{DD}	I	Power supply terminal
90	SPAW	I	Signal processor address setting terminal
91	SPSTB	I	Signal processor strobe signal
92	SPRDY	O	Data transfer command signal
93	UNLOK	O	PLL unlock signal
94	DISYND	—	Not used, open
95	NSTBY	I	Not used, connected to power supply

Pin No.	Mark	I/O Division	Function
96	NRST	I	Reset signal
97	M7CK	—	Master clock signal (Not used, open)
98	R6CP/(ENVT)	O	Timing signal for RF envelope signal control
99	R3CP		
100	V_{SS}	—	GND terminal
101	SRRF	O	Recording signal
102	V_{DD}	I	Power supply terminal
103	SRPR	O	Recording/playback select signal (REC: "H", PLAY: "L")
104	SRWND 2	O	ATF area det. signal
105	SRWND 1	O	Track pitch signal
106	PBDT	I	Playback signal
107	PBCK	I	Playback envelope signal
108	RFMSK	—	Not used, open
109	PLLOFS	O	PLL off-set information signal
110	HFCH	O	System clock signal
111	VFPLFS	O	PLL OFS effective information signal
112	EXFCH	—	Not used, connected to GND
113	EEMD	—	Not used, connected to GND
114	V_{SS}	—	GND terminal
115	SL NRZI	—	Not used, connected to GND
116	SELF CH0		
117	SELF CH1	—	Not used, connected to GND
118	V_{DD}	I	Power supply terminal
119	M9CP	O	Master clock signal
120	HSW	I	Head switching signal
121	NR TRST	I	Not used, connected to power supply
122	SUBWND	—	Not used, open
123	IPF	O	Output terminal for flag counter (Not used, open)
124	SUBC 1		

• IC305 (SM5843AS1): Digital filter

Pin No.	Mark	I/O Division	Function
1	DI/$\overline{INF2}$	I	Input data (INF1N: "L") Input format select 2 (INF1N: "H")
2	BCKI	I	Serial bit clock input terminal
3	$\overline{CKSL}$	I	Clock input frequency select terminal ("H": 384 fs, "L": 256 fs)
4	$\overline{INF1}$	I	Input format select 1
5	$\overline{IW1}$/DIL	I	Input bit select 1 (INF1N: "L") L ch data input (INF1N: "H")
6	XTI	I	Clock input terminal
7	XTO	O	Clock output terminal (Not used, open)
8	V_{SS}	—	GND terminal
9	CKO	O	Clock output terminal (Not used, open)
10	$\overline{IW2}$/DIR	I	Input bit select 2 (INF1N: "L") R ch data input (INF1N: "H")
11	MDT	I	Attenuation command serial data input terminal
12	MCK	I	Attenuation command bit clock input terminal
13	$\overline{MLE}$	I	Attenuation command latch clock input terminal
14	$\overline{RST}$	I	System reset terminal ("L": Active)
15	MUTE	I	Muting control terminal ("H": Mute)
16	DEMP	I	Digital de-emphasis ON/OFF ("H": ON)
17	FSEL1	I	De-emphasis filter select terminal
18	FSEL2		

fs (Hz)	32 k	44.1 k	48 k	Test
FSEL1	H	L	L	H
FSEL2	H	L	H	L

Pin No.	Mark	I/O Division	Function
19	$\overline{OW2O}$	I	Output bit select terminal ("H": 18 bit, "L": 20 bit)
20	$\overline{SYNC}$	I	Synchronizing mode select ("L": Forced mode, "H": Jitter free mode)
21	NC	—	No connected, open
22	V_{DD}	I	Power supply terminal
23	DOR	O	R ch data output
24	DOL	O	L ch data output
25	WCKO	O	Word clock output
26	BCKO	O	Serial bit clock output terminal
27	TMOD	I	Filter response select ("H": Response 1, "L": Response 2)
28	LRCI	I	Sample rate (fs) clock signal

• IC507, 508 (PCM1702P): D/A converter

Pin No.	Mark	I/O Division	Function
1	DATA	I	Serial data
2	CLOCK	I	Bit clock
3	$+V_{DD}$	I	Digital +5 V power supply
4	DGND	I	Digital GND terminal
5	$-V_{DD}$	I	Digital −5 V power supply
6	LE	I	Latch enable
7	NC	—	Not used, open
8	NC	—	Not used, open
9	$+V_{CC}$	I	Analog +5 V power supply
10	BPO DC	I/O	Bpo decoupple
11	IOUT	O	Current out
12	AGND	I	Analog GND terminal
13	AGND	I	Analog GND terminal
14	SERV	I/O	Servo decoupple
15	REF	I/O	Ref decoupple
16	$-V_{CC}$	I	Analog −5 V power supply

• IC601 (M50754-165FP): Panel control & FL drive

Pin No.	Mark	I/O Division	Function
1	V_{SS}	—	GND terminal
2	P 27	O	Input select signal (DIGITAL ↔ ANALOG)
3	P 26	O	LED display drive terminal (PAUSE)
4	P 25	O	LED display drive terminal (REC)
5	P 24	O	LED display drive terminal (PLAY)
6 ∫ 8	P 23 ∫ P 21	I	Key return signal
9	P 20	O	Buffer control signal
10	NC	—	Not connection
11	NPRDY	O	Ready signal
12	NTRCLK	I/O	Serial data transmission/reception clock signal
13	RXD	O	Serial data transmission signal
14	TXD	I	Serial data reception signal
15	P 33	O	Not connection
16	P 32	—	
17	P 31	O	LED display drive terminal (S. PLAY)
18	P 30	O	LED display drive terminal (A. PNO)
19	INT 1	I	Remote control signal
20	INT 2	I	Not used, connected to power supply
21	CNV_{SS}	—	GND terminal
22	RST	I	Reset signal ("L": RESET)
23	NC	—	Not connection
24	X IN	I	Master clock terminal (6 MHz)
25	X OUT	O	
26	NC	—	Not connection
27	X CIN	—	Not used, connected to GND
28	X COUT	—	Not used, open
29	V_{SS}	—	GND terminal
30	NC	—	Not connection
31	P 57	I	Key return signal
32	P 56		
33	P 55		
34	P 54		

Pin No.	Mark	I/O Division	Function
35	VP	I	Power supply terminal for FL drive
36	P 51	O	Segment signal for FL drive
37	P 50		
38 ∫ 45	P 17 ∫ P 10		
46	NC	—	Not connection
47	P 07	O	Segment signal for FL drive
48	P 06		
49	P 05		
50	P 04		
51	P 03		
52	P 02		
53	P 01		
54	P 00		
55	P 47		
56	P 46		
57	P 45		
58	P 44		
59	P 43		
60	P 42		
61	P 41		
62	P 40		
63	V_{CC}	I	Power supply terminal
64	V_{CC}		
65	V_{SS}	—	GND terminal
66	P 65	O	Digit signal for FL drive and key scan signal
67	P 64		
68	P 63		
69	P 62		
70	P 61		
71	P 60		
72	NC	—	Not connection

• IC405 (AK5339-VP): A/D converter

Pin No.	Mark	I/O Division	Function
1	A. GND	—	Analog GND terminal
2	AINL	I	Analog data (L ch) signal
3	ZEROL	I	Not used, connected to GND
4	VA+	I	Power supply terminal (+)
5	VA—	I	Power supply terminal (—)
6	APD	I	Reset signal
7	ACAL	I	Not used, connected to GND
8	NC	—	Not used, open
9	DCAL	O	Relay control terminal
10	DPO	I	Reset sihnal
11	TST	—	Not used, connected to GND
12	CMODE	—	Not used, connected to GND
13	SMODE	—	Not used, connected to GND
14	L/R	I/O	L/R discrimination signal

Pin No.	Mark	I/O Division	Function
15	SCLK	I/O	Serial bit clock output terminal
16	SDATA	O	Digital data signal
17	FSYNC	I	Not used, connected to power supply
18	VD+	I	Power supply terminal
19	D. GND	—	Digital GND terminal
20	CLK	I	Clock input terminal
21	OCLK	O	Clock output terminal
22	NC	—	Not used, open
23	ICLK	I	Clock input terminal
24	LGND	—	GND terminal
25	VL+	I	Power supply terminal (+)
26	ZEROR	—	Not used, connected to GND
27	AINR	I	Analog data (R ch) signal
28	VREF	O	Reference voltage terminal

■ KEY POINTS FOR TROUBLESHOOTING

Mechanism block
- Loading mechanism
  - Post roller
  - Tension regulator
  - Pinch roller
  - Brake lever
- Brake mechanism
  - Brake lever
  - Solenoid
  - Solenoid driver
- Mechanism switch block
  - Tape hole detection switch
  - Cassette detection switch
  - Holder switch
- Reel FG block
  - Detection photo transistor
  - Detection LED
  - Reel FG amp (servo P.C.B.)
- FPC & FPC connector

Mode motor block
- Mode motor
- Mode switch
- Mode motor driver circuit

Master clock block
- 28MHz oscillator
- 16MHz, 22MHz, 24MHz oscillate and select circuit

Panel switch block
- Switch
- Panel control IC

Head, RF block
- Head FPC & FPC connector
- Head dirty
- Head cracked or damaged
- RF recording current
- Playback eye pattern

Tape begin/end detection block
- Begin/end detection photo transistor
- Begin/end detection LED
- Comparator circuit
- FPC & FPC connector

Power supply block
- Power supply regulator output
- Fuse

Capstan block
- Capstan FG
- FG amp
- Motor driver output
- Motor current

Cylinder block
- Cylinder FG
- Cylinder PG
- FG amp
- PG amp
- Motor driver output
- Motor current

ATF block
- RF ATF output
  - ATF SYNC output
- ATF select circuit
- ATF gate allay

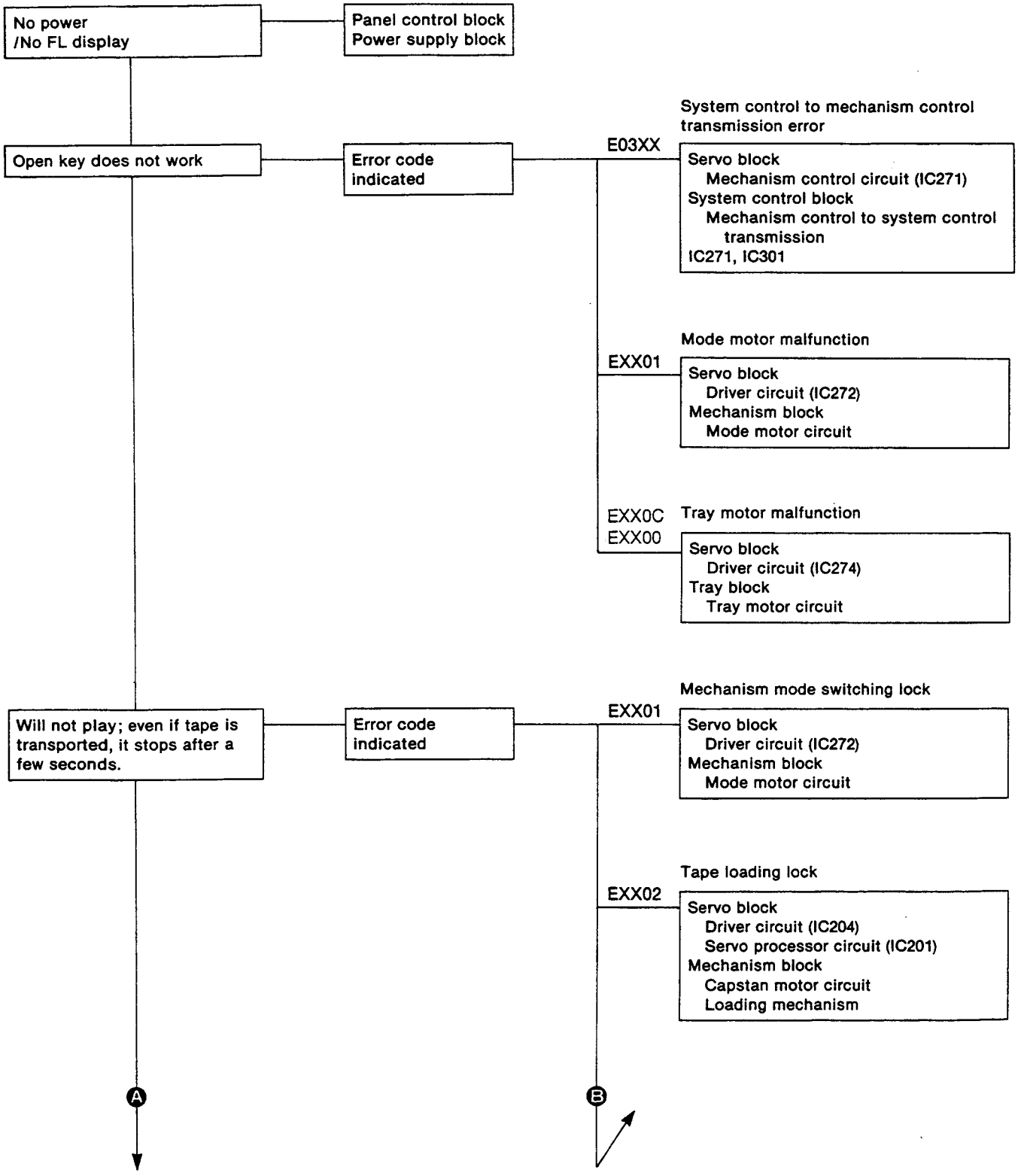
Signal processor block
- Data & clock to D/A
- Data & clock to A/D
- All clocks

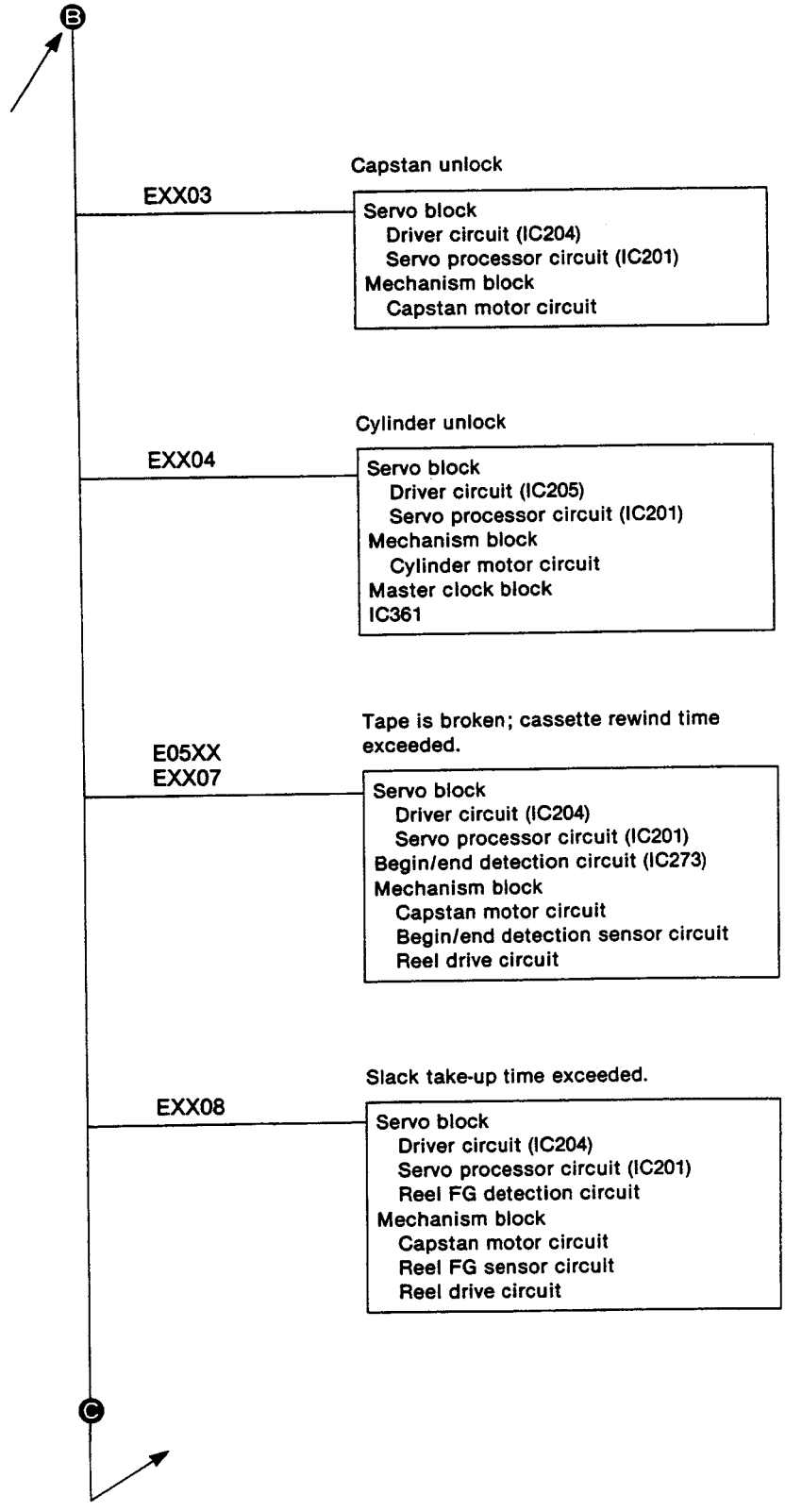
Digital output block
- Digital output PB

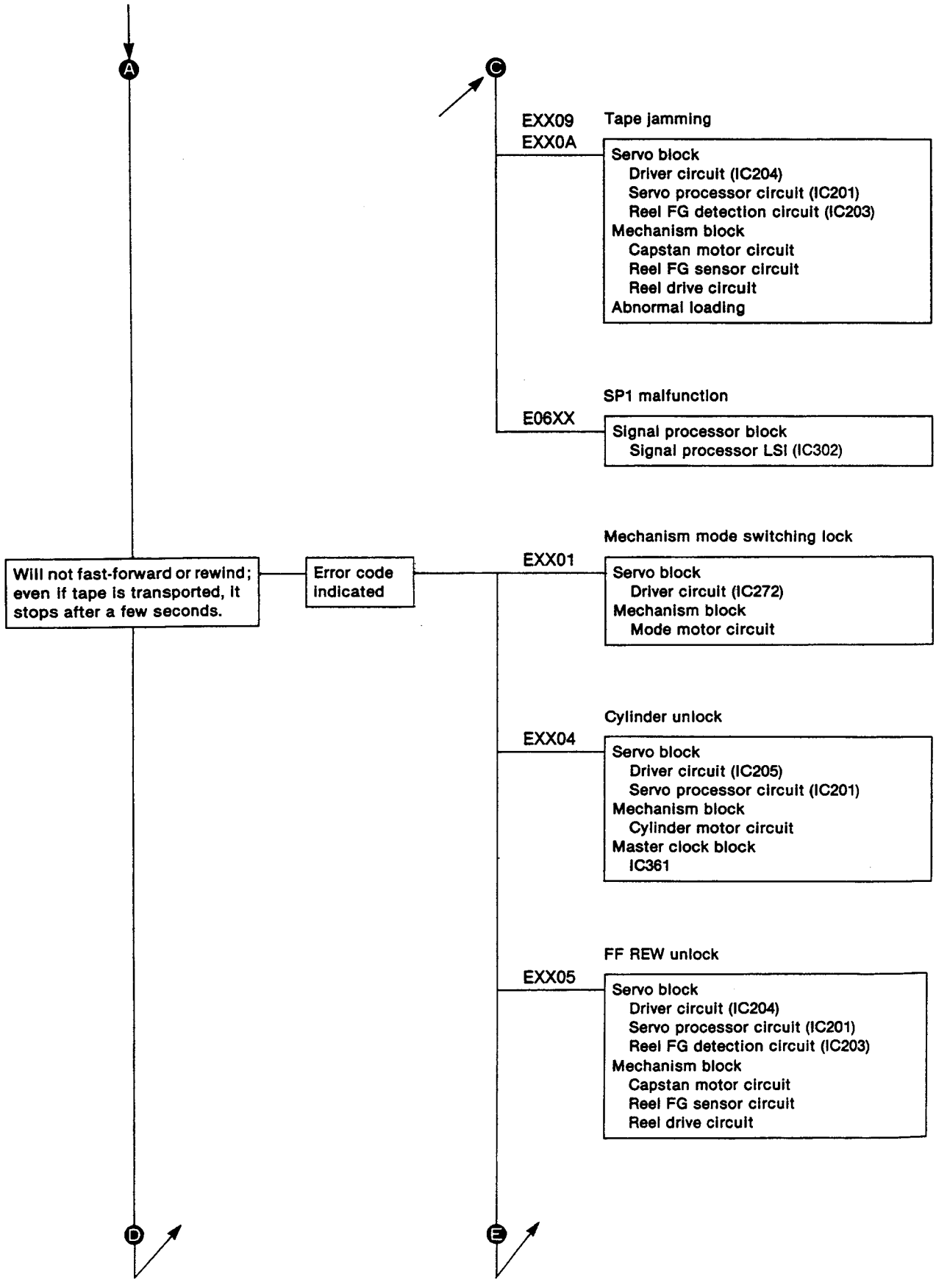
Panel control block
- Panel control block
- Transfer between panel and system control
- Panel control reset

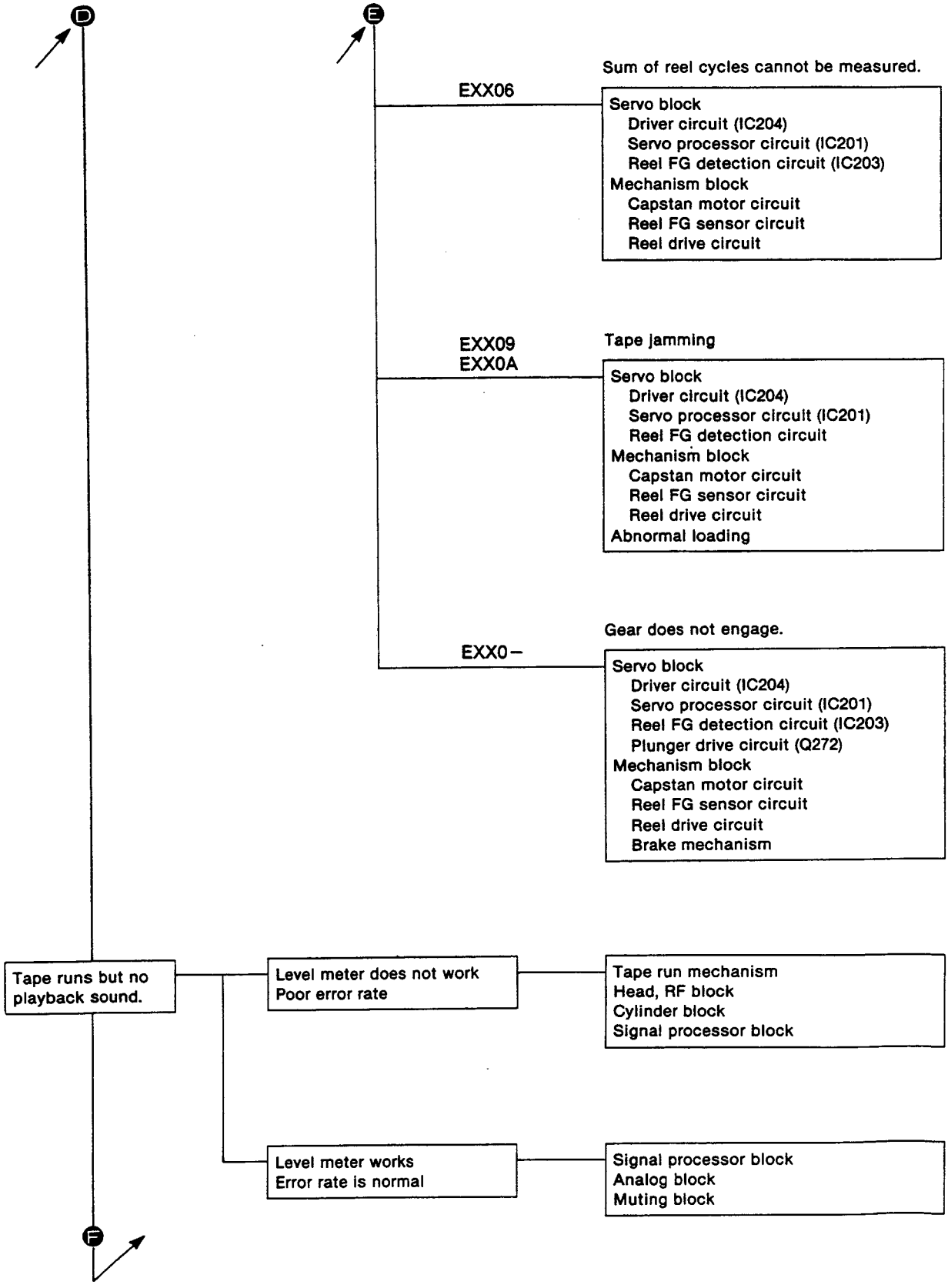
Analog block
- Input amplifier
- Output amplifier
- Muting circuit
- A/D converter
- D/A converter

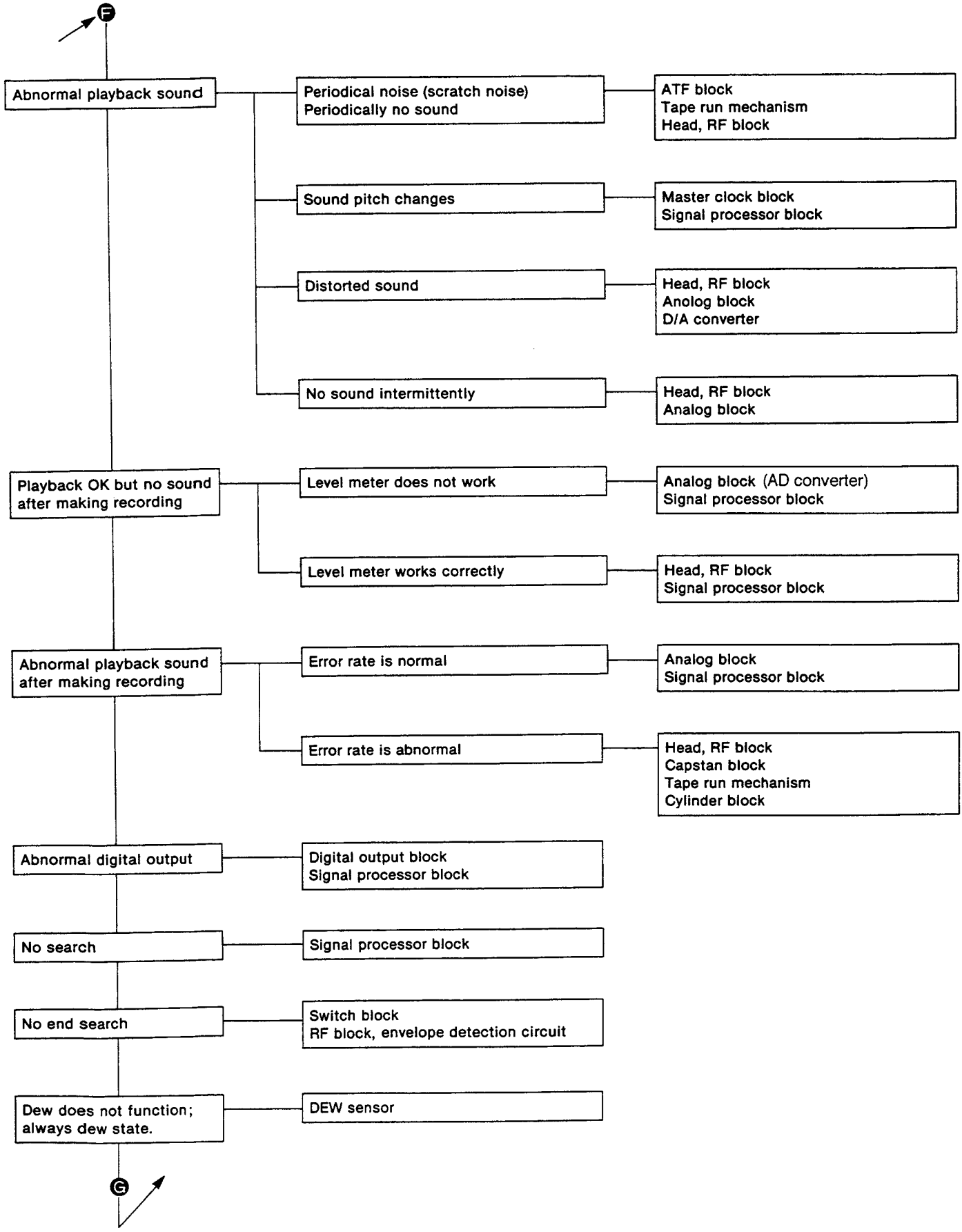
■TROUBLESHOOTING

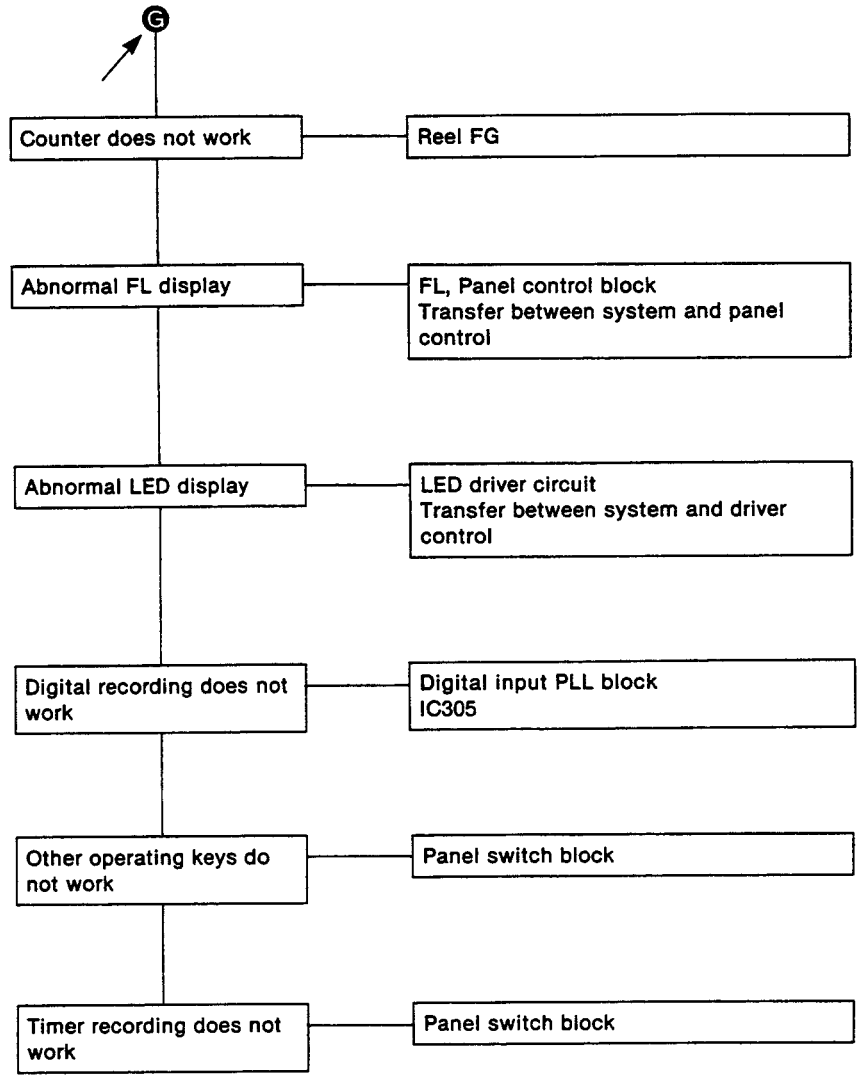



B
Capstan unlock
EXX03
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Mechanism block
Capstan motor circuit
Cylinder unlock
EXX04
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
IC361
Tape is broken; cassette rewind time exceeded.
E05XX
EXX07
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Begin/end detection circuit (IC273)
Mechanism block
Capstan motor circuit
Begin/end detection sensor circuit
Reel drive circuit
Slack take-up time exceeded.
EXX08
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
C


A
C
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
SP1 malfunction
E06XX
Signal processor block
Signal processor LSI (IC302)
Will not fast-forward or rewind; even if tape is transported, it stops after a few seconds.
Error code indicated
Mechanism mode switching lock
EXX01
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
Cylinder unlock
EXX04
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
IC361
FF REW unlock
EXX05
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
D
E


D
E
Sum of reel cycles cannot be measured.
EXX06
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Tape jamming
EXX09
EXX0A
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
Gear does not engage.
EXX0–
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Plunger drive circuit (Q272)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Brake mechanism
Tape runs but no playback sound.
Level meter does not work
Poor error rate
Tape run mechanism
Head, RF block
Cylinder block
Signal processor block
Level meter works
Error rate is normal
Signal processor block
Analog block
Muting block
F


F
Abnormal playback sound
Periodical noise (scratch noise)
Periodically no sound
ATF block
Tape run mechanism
Head, RF block
Sound pitch changes
Master clock block
Signal processor block
Distorted sound
Head, RF block
Anolog block
D/A converter
No sound intermittently
Head, RF block
Analog block
Playback OK but no sound after making recording
Level meter does not work
Analog block (AD converter)
Signal processor block
Level meter works correctly
Head, RF block
Signal processor block
Abnormal playback sound after making recording
Error rate is normal
Analog block
Signal processor block
Error rate is abnormal
Head, RF block
Capstan block
Tape run mechanism
Cylinder block
Abnormal digital output
Digital output block
Signal processor block
No search
Signal processor block
No end search
Switch block
RF block, envelope detection circuit
Dew does not function; always dew state.
DEW sensor
G



PARTS SECTION

1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
   Components indentified by "<!>" have special characteristics important for safety.
   When replacing any of these components, use only the original ones.
   Meaning of symbol "<!>" on this parts list is exactly the same as synbol⚠on Schematic and Circuit Board Diagrams.
3. Unless otherwise specified;
   All resistors are in (Ω), K=1,000Ω, M=1,000kΩ.
   All capacitors are in (F), U=10^{-6}F, P=10^{-12}F.
4. ITEM NUMBERS WITH CAPITAL LETER E
   Item numbers woth capital leter E (Example: E1, E2, ...) in Ref. no. column mean that the parts are listed with the E item numbers in the exploded views.
5. When ordering parts, use parts No. only form Part No. column.
6. Printed circuit board assembly with mark (RTL) is no longer available after discontinuation of the product.

■RESISTORS AND CAPACITORS

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		RESISTORS		
R11	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R12	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R13	ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R15,16	ERG1ANJP560	M.RESISTOR 1W 56	2	
R21,22	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R23,24	ERJ6GEYJ471	M.RESISTOR 1/10W 470	2	
R101,102	ERJ6GEYJ221	M.RESISTOR 1/10W 220	2	
R103,104	ERJ6GEYJ681	M.RESISTOR CH1/10W 680	2	
R112,113	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	2	
R115	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	1	
R117	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R118	ERJ6GEYJ471	M.RESISTOR 1/10W 470	1	
R123	ERJ6GEYJ822	M.RESISTOR CH1/10W 8.2K	1	
R124	ERJ6GEYJ152	M.RESISTOR CH1/10W 1.5K	1	
R126	ERJ6GEYJ152	M.RESISTOR CH1/10W 1.5K	1	
R128	ERJ6GEYJ822	M.RESISTOR CH1/10W 8.2K	1	
R131	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R132,133	ERJ6GEYJ221	M.RESISTOR 1/10W 220	2	
R134	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R135,136	ERJ6GEYJ471	M.RESISTOR 1/10W 470	2	
R150	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R151,152	ERJ6GEYJ471	M.RESISTOR 1/10W 470	2	
R153	ERJ6GEYJ223	M.RESISTOR 1/10W 22K	1	
R154,155	ERJ6GEYJ471	M.RESISTOR 1/10W 470	2	
R156,157	ERJ6GEYJ222	M.RESISTOR CH1/10W 2.2K	2	
R158	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R159	ERJ6GEYJ223	M.RESISTOR 1/10W 22K	1	
R160	ERJ6GEYJ221	M.RESISTOR 1/10W 220	1	
R162	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	1	
R164,165	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	2	
R167	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	1	
R168	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R169	ERJ6GEYJ471	M.RESISTOR 1/10W 470	1	
R172	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R173,174	ERJ6GEYJ222	M.RESISTOR CH1/10W 2.2K	2	
R175	ERJ6GEYJ151	M.RESISTOR CH1/10W 150	1	
R176	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	1	
R178	ERJ6GEYJ820	M.RESISTOR CH1/10W 82	1	
R181	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R193-195	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	3	
R196	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R197	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R201	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R202,203	ERJ6GEYJ223	M.RESISTOR 1/10W 22K	2	
R204	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R205	ERJ6GEYJ683	M.RESISTOR 1/10W 68K	1	
R206	ERJ6GEYJ684	M.RESISTOR 1/10W 680K	1	
R207	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	1	
R208	ERJ6GEYJ683	M.RESISTOR 1/10W 68K	1	
R209	ERJ6GEYJ153	M.RESISTOR 1/10W 15K	1	
R210	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R212	ERJ6GEYJ105	M.RESISTOR CH1/10W 1M	1	
R213	ERJ6GEYJ274	M.RESISTOR CH1/10W 270K	1	
R214	ERJ6GEYJ682	M.RESISTOR CH1/10W 6.8K	1	
R215	ERJ6GEYJ184	M.RESISTOR CH1/10W 180K	1	
R216	ERJ6GEYJ101	C.RESISTOR 1/10W 100	1	
R217,218	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	2	
R219,220	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	2	
R221,222	ERJ6GEYJ474	M.RESISTOR CH1/10W 470K	2	
R223,224	ERJ6GEYJ222	M.RESISTOR CH1/10W 2.2K	2	
R225,226	ERJ6GEYJ184	M.RESISTOR CH1/10W 180K	2	
R227	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R228	ERJ6GEYJ222	M.RESISTOR CH1/10W 2.2K	1	
R229	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R230	ERJ6GEYJ681	M.RESISTOR CH1/10W 680	1	
R231	ERJ6GEYJ821	C.RESISTOR 1/10W 820	1	
R232	ERJ6GEYJ333	M.RESISTOR 1/10W 33K	1	
R233	ERJ6GEYJ393	M.RESISTOR CH1/10W 39K	1	
R234	ERJ6GEYJ333	M.RESISTOR 1/10W 33K	1	
R235	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R236	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	1	
R237	ERX12SJR33E	M.RESISTOR 1/2W 0.33	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R240	ERJ6GEYJ151	M.RESISTOR CH1/10W 150	1	
R241	ERJ6GEYJ333	M.RESISTOR 1/10W 33K	1	
R242	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R243	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R244	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R245	ERX12SJR33E	M.RESISTOR 1/2W 0.33	1	
R247	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R248	ERJ6GEYJ822	M.RESISTOR CH1/10W 8.2K	1	
R249	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	1	
R250	ERJ6GEYJ153	M.RESISTOR 1/10W 15K	1	
R251	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	1	
R271,272	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	2	
R273	ERJ6GEYJ681	M.RESISTOR CH1/10W 680	1	
R274	ERSB39JR82U	T.RESISTOR 1/4W 0.82	1	
R275	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R277,278	ERJ6GEYJ333	M.RESISTOR 1/10W 33K	2	
R279	ERJ6GEYJ683	M.RESISTOR 1/10W 68K	1	
R280	ERJ6GEYJ333	M.RESISTOR 1/10W 33K	1	
R281	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	1	
R282	ERJ6GEYJ682	M.RESISTOR CH1/10W 6.8K	1	
R284	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R285	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	1	
R286	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R287	ERJ6GEYJ684	M.RESISTOR 1/10W 680K	1	
R289,290	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	2	
R292,293	ERJ6GEYJ563	M.RESISTOR CH1/10W 56K	2	
R294-296	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	3	
R297	ERJ6GEYJ220	M.RESISTOR CH1/10W 22	1	
R298	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R301-309	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	9	
R310-313	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	4	
R314-319	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	6	
R321-330	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	10	
R331-338	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	8	
R339	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R340	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R341	ERJ6GEYJ153	M.RESISTOR 1/10W 15K	1	
R342	ERJ6GEYJ183	M.RESISTOR 1/10W 18K	1	
R343	ERJ6GEYJ683	M.RESISTOR 1/10W 68K	1	
R344	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R345-347	ERJ6GEYJ822	M.RESISTOR CH1/10W 8.2K	3	
R348	ERJ6GEYJ103	M.RESISTOR CH1/10W 10K	1	
R349	ERJ6GEYJ393	M.RESISTOR CH1/10W 39K	1	
R350	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	1	
R351-353	ERJ6GEYJ561	M.RESISTOR 1/10W 560	3	
R354	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R355	ERJ6GEYJ561	M.RESISTOR 1/10W 560	1	
R356-364	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	9	
R365,366	ERJ6GEYJ561	M.RESISTOR 1/10W 560	2	
R367	ERJ6GEYJ105	M.RESISTOR CH1/10W 1M	1	
R368-371	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	4	
R372,373	ERJ6GEYJ561	M.RESISTOR 1/10W 560	2	
R374,375	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	2	
R378-380	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	3	
R381,382	ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R383,384	ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R385,386	ERJ6GEYJ153	M.RESISTOR 1/10W 15K	2	
R387,388	ERJ6GEYJ270	M.RESISTOR CH1/10W 27	2	
R389	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R390	RRJ6GCAD750T	M.RESISTOR CH1/10W 75	1	
R391	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R392	ERJ6GEYJ334	M.RESISTOR CH1/10W 330K	1	
R393	ERJ6GEYJ470	M.RESISTOR CH1/10W 47	1	
R394	ERJ6GEYJ100	M.RESISTOR CH1/10W 10	1	
R395	RRJ6GCAD750T	M.RESISTOR CH1/10W 75	1	
R396	ERJ6GEYJ470	M.RESISTOR CH1/10W 47	1	
R397	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R398	ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R399	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R401,402	RRJ6GCAD183T	M.RESISTOR CH1/10W 18K	2	
R403-410	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	8	
R411-416	RRJ6GCAD472T	M.RESISTOR CH1/10W 4.7K	6	
R417-420	RRJ6GCAD103T	M.RESISTOR CH1/10W 10K	4	
R421-424	RRJ6GCAD472T	M.RESISTOR CH1/10W 4.7K	4	
R425,426	ERDS2TJ101	C.RESISTOR 1/4W 100	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R435,436	ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R437,438	RRJ6GCAD103T	M.RESISTOR CH1/10W 10K	2	
R439,440	RRJ6GCAD472T	M.RESISTOR CH1/10W 4.7K	2	
R441,442	RRJ6GCAD273T	M.RESISTOR CH1/10W 27K	2	
R443,444	ERJ6GEYJ470	M.RESISTOR CH1/10W 47	2	
R445,446	ERJ6GEYJ225	M.RESISTOR CH1/10W 2.2M	2	
R447	ERJ6GEYJ331	M.RESISTOR CH1/10W 330	1	
R448	ERJ6GEYJ561	M.RESISTOR 1/10W 560	1	
R449,450	ERJ6GEYJ225	M.RESISTOR CH1/10W 2.2M	2	
R451-454	RRJ6GCAD472T	M.RESISTOR CH1/10W 4.7K	4	
R455-458	RRJ6GCAD562T	M.RESISTOR CH1/10W 5.6K	4	
R459-462	RRJ6GCAD332T	M.RESISTOR CH1/10W 3.3K	4	
R463,464	ERJ6GEYJ820	M.RESISTOR CH1/10W 82	2	
R465	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	1	
R501-504	ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R505-508	ERDS2TJ331	C.RESISTOR 1/4W 330	4	
R509-512	ERJ6GEYJ470	M.RESISTOR CH1/10W 47	4	
R513,514	RRJ6GCAD183T	M.RESISTOR CH1/10W 18K	2	
R515,516	ERJ6GEYJ394	M.RESISTOR CH1/10W 390K	2	
R517,518	RRJ6GCAD183T	M.RESISTOR CH1/10W 18K	2	
R519,520	ERJ6GEYJ394	M.RESISTOR CH1/10W 390K	2	
R521-524	RRJ6GCAD822T	M.RESISTOR CH1/10W 8.2K	4	
R525,526	RRJ6GCAD183T	M.RESISTOR CH1/10W 18K	2	
R527,528	ERJ6GEYJ124	M.RESISTOR CH1/10W 120K	2	
R529-536	RRJ6GCAD822T	M.RESISTOR CH1/10W 8.2K	8	
R537,538	ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R541,542	RRJ6GCAD562T	M.RESISTOR CH1/10W 5.6K	2	
R543,544	RRJ6GCAD332T	M.RESISTOR CH1/10W 3.3K	2	
R545,546	RRJ6GCAD472T	M.RESISTOR CH1/10W 4.7K	2	
R547,548	RRJ6GCAD122T	M.RESISTOR CH1/10W 1.2K	2	
R549,550	ERJ6GEYJ105	M.RESISTOR CH1/10W 1M	2	
R551,552	ERJ6GEYJ102	C.RESISTOR 1/10W 1K	2	
R553,554	ERJ6GEYJ473	C.RESISTOR 1/10W 47K	2	
R555-558	ERJ6GEYJ472	M.RESISTOR CH1/10W 4.7K	4	
R559,560	RRJ6GCAD222T	M.RESISTOR CH1/10W 2.2K	2	
R561,562	RRJ6GCAD562T	M.RESISTOR CH1/10W 5.6K	2	
R563-566	RRJ6GCAD272T	M.RESISTOR CH1/10W 2.7K	4	
R567,568	RRJ6GCAD222T	M.RESISTOR CH1/10W 2.2K	2	
R569,570	ERJ6GEYJ104	M.RESISTOR CH1/10W 100K	2	
R573,574	ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R575,576	ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R577,578	ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R579,580	ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R581,582	ERDS2TJ104	C.RESISTOR 1/4W 100K	2	
R583,584	ERDAS3G100	C.RESISTOR 1/4W 10	2	
R585,586	ERDAS3G330	C.RESISTOR 1/4W 33	2	
R587,588	ERDAS3G332	C.RESISTOR 1/4W 3.3K	2	
R589,590	ERDAS3G102	C.RESISTOR 1/4W 1K	2	
R591,592	ERDS2EJ121	C.RESISTOR 1/4W 120	2	
R593-596	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	4	
R599	ERJ6GEYJ332	C.RESISTOR 1/10W 3.3K	1	
R601-604	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	4	
R605	ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R606-608	ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R610,611	ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R612	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R613-619	ERDS2TJ103	C.RESISTOR 1/4W 10K	7	
R620	ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R621	ERDS2TJ105	C.RESISTOR 1/4W 1M	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		CAPACITORS		
C1	ECKWRS102MBY	C.CAPACITOR 400V 0.01U	1	<!>
C11-20	ECKF1H103ZF	C.CAPACITOR 50V 0.01U	10	
C21,22	ECEA1EPZ332	E.CAPACITOR 25V 3300U	2	<!>
C23	ECES1EU682G	E.CAPACITOR 25V 680U	1	<!>
C24	ECEA1CU472	E.CAPACITOR 16V 4700U	1	<!>
C25	ECEA1HU221	E.CAPACITOR 50V 220U	1	
C26-29	ECEA1CU100	E.CAPACITOR 16V 10U	4	
C32	ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C41,42	ECEA1CU101	E.CAPACITOR 16V 100U	2	
C43	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C44,45	ECEA1CU101	E.CAPACITOR 16V 100U	2	
C46	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C47,48	ECEA0JU101	E.CAPACITOR 6.3V 100U	2	
C49,50	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	2	
C101,102	ECUM1H222KBN	C.CAPACITOR 50V 2200P	2	
C103,104	ECUM1H471KCN	C.CAPACITOR CH 50V 470P	2	
C105	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	1	
C107	ECUM1H222KBN	C.CAPACITOR 50V 2200P	1	
C110	ECEA0JK221	E.CAPACITOR 6.3V 220U	1	
C123	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C124,125	ECUM1H472KBN	C.CAPACITOR CH 50V 4700P	2	
C126,127	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	2	
C129,130	ECEA0JKS220	E.CAPACITOR 6.3V 22U	2	
C131	ECUM1H222KBN	C.CAPACITOR 50V 2200P	1	
C150	ECUM1H471KCN	C.CAPACITOR CH 50V 470P	1	
C151	ECUM1H222KBN	C.CAPACITOR 50V 2200P	1	
C152	ECUM1H102KBN	C.CAPACITOR 50V 1000P	1	
C154	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C155,156	ECUM1H102KBN	C.CAPACITOR 50V 1000P	2	
C157	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C159	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C161	ECUM1H562KBN	C.CAPACITOR CH 50V 5600P	1	
C163	ECUM1H562KBN	C.CAPACITOR CH 50V 5600P	1	
C166	ECUM1E153MBN	C.CAPACITOR CH 25V 0.015U	1	
C167	ECUM1H102KBN	C.CAPACITOR 50V 1000P	1	
C168	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C169	ECUM1H100JCN	C.CAPACITOR CH 50V 10P	1	
C171,172	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	2	
C173	ECUM1H471KCN	C.CAPACITOR CH 50V 470P	1	
C174	ECUM1E104MBN	C.CAPACITOR CH 25V 0.1U	1	
C175	ECUM1H472KBN	C.CAPACITOR CH 50V 4700P	1	
C176	ECUM1E333MDN	C.CAPACITOR CH 25V 0.033U	1	
C177,178	ECUM1H101KCN	C.CAPACITOR CH 50V 100P	2	
C179	ECUM1E104MBN	C.CAPACITOR CH 25V 0.1U	1	
C181	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C185,186	ECUM1H331KCN	C.CAPACITOR CH 50V 330P	2	
C187	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	1	
C188	ECUM1H331KCN	C.CAPACITOR CH 50V 330P	1	
C190	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C201	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C202	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C203,204	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	2	
C205,206	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C207	ECUM1H271KCN	C.CAPACITOR CH 50V 270P	1	
C208	ECUM1H221KCN	C.CAPACITOR CH 50V 220P	1	
C209,210	ECUM1E104MBN	C.CAPACITOR CH 25V 0.1U	2	
C211	ECUM1H221KCN	C.CAPACITOR CH 50V 220P	1	
C212,213	ECEA1CK220	E.CAPACITOR 16V 22U	2	
C214,215	ECUM1H101KCN	C.CAPACITOR CH 50V 100P	2	
C216,217	ECUM1C105ZFM	C.CAPACITOR 16V 1U	2	
C218,219	ECUM1H390KCN	C.CAPACITOR CH 50V 39P	2	
C220,221	ECUM1H121KCN	C.CAPACITOR CH 50V 120P	2	
C222,223	ECUM1C105ZFM	C.CAPACITOR 16V 1U	2	
C224	ECQV1H683JZ	P.CAPACITOR 50V 0.68U	1	
C225,226	ECUM1H332MBN	C.CAPACITOR CH 50V 3300P	2	
C227	ECUM1E333MDN	C.CAPACITOR CH 25V 0.033U	1	
C228	ECUM1H181KCN	C.CAPACITOR CH 50V 180P	1	
C229	ECEA0JK221B	E.CAPACITOR 6.3V 220U	1	
C230	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C231	ECEA1AU470	E.CAPACITOR 10V 47U	1	
C232	ECEA1CK220	E.CAPACITOR 16V 22U	1	
C233	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C234	ECEA1CK470	E.CAPACITOR 16V 47U	1	
C235,236	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C237	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C238	ECUM1E223MBN	C.CAPACITOR CH 25V 0.022U	1	
C239	ECUM1E683MBN	C.CAPACITOR CH 25V 0.068U	1	
C240	ECUM1E153MBN	C.CAPACITOR CH 25V 0.015U	1	
C241	ECUM1E104MBN	C.CAPACITOR CH 25V 0.1U	1	
C242-246	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	5	
C247,248	ECUM1E333MDN	C.CAPACITOR CH 25V 0.033U	2	
C249	ECUM1E153MBN	C.CAPACITOR CH 25V 0.015U	1	
C250	ECUM1E104MBN	C.CAPACITOR CH 25V 0.1U	1	
C251-253	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	3	
C260	ECUM1E334ZFM	C.CAPACITOR CH 25V 0.33U	1	
C268	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C269	ECUM1E103KBN	C.CAPACITOR 25V 0.01U	1	
C270	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C271	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C272	ECUM1E223MBN	C.CAPACITOR CH 25V 0.022U	1	
C273	ECUM1H101KCN	C.CAPACITOR CH 50V 100P	1	
C274	ECUM1E103KBN	C.CAPACITOR 25V 0.01U	1	
C275	ECUM1C105ZFM	C.CAPACITOR 16V 1U	1	
C276	ECUM1H221KCN	C.CAPACITOR CH 50V 220P	1	
C280	ECUM1C334ZFN	C.CAPACITOR CH 16V 0.33U	1	
C301-303	ECEA0JU101	E.CAPACITOR 6.3V 100U	3	
C304	ECUM1H050CCN	C.CAPACITOR CH 50V 5P	1	
C305	ECUM1H102KBN	C.CAPACITOR 50V 1000P	1	
C306	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C307,308	ECUM1H040CCN	C.CAPACITOR CH 50V 4P	2	
C309,310	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	2	
C311,312	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	2	
C313	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	1	
C314	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C317-338	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	22	
C339	ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C340-342	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	3	
C343	ECUM1E473MBN	C.CAPACITOR 25V 0.047U	1	
C344	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C345,346	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C347	ECUM1H471JCN	C.CAPACITOR 50V 470P	1	
C348	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
C349	ECUM1H681KBN	C.CAPACITOR 50V 680P	1	
C350	ECUM1H101KCN	C.CAPACITOR CH 50V 100P	1	
C351	ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C352	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C371,372	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	2	
C373,374	ECUM1H470KCN	C.CAPACITOR 50V 47P	2	
C376	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C377,378	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	2	
C379,380	ECUM1H151KCN	C.CAPACITOR CH 50V 150P	2	
C381	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C382,383	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C384	ECUM1H470KCN	C.CAPACITOR 50V 47P	1	
C385	ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C386	ECUM1H470KCN	C.CAPACITOR 50V 47P	1	
C387	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	1	
C388,389	ECEA0JU330	E.CAPACITOR 6.3V 33U	2	
C390-393	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	4	
C401-404	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	4	
C405-408	ECEA1CPZ470B	E.CAPACITOR 16V 47U	4	
C409-416	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	8	
C417,418	ECEA1CPZ221	E.CAPACITOR 16V 220U	2	
C419,420	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	2	
C421,422	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C423-426	ECEA1CPZ470	E.CAPACITOR 16V 47U	4	
C427,428	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	2	
C429,430	ECQB1H562JF	P.CAPACITOR 50V 5600P	2	
C432,433	ECEA0JPZ221	E.CAPACITOR 6.3V 220U	2	
C434,435	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	2	
C436	ECEA1CU100	E.CAPACITOR 16V 10U	1	
C437	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C438	ECEA1CU220	E.CAPACITOR 16V 22U	1	
C439	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C440	ECEA0JPZ221	E.CAPACITOR 6.3V 220U	1	
C441	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C442	ECUM1H100CCN	C.CAPACITOR CH 50V 10P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C443-447	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	5	
C448	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	1	
C501-504	ECUM1H681KBN	C.CAPACITOR 50V 680P	4	
C505-508	ECEA1CPZ221	E.CAPACITOR 16V 220U	4	
C509-512	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	4	
C513,514	ECEA1CU471	E.CAPACITOR 16V 470U	2	
C515,516	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	2	
C517	ECUM1E104ZFN	C.CAPACITOR 25V 0.1U	1	
C521,522	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	2	
C523,524	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	2	
C525,526	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	2	
C527,528	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	2	
C529-532	ECQB1H182JF	P.CAPACITOR 50V 1800P	4	
C533,534	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	2	
C535-538	ECEA0JPZ221	E.CAPACITOR 6.3V 220U	4	
C539-542	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	4	
C543,544	ECEA0JU470	E.CAPACITOR 6.3V 47U	2	
C545,546	ECEA0JU101	E.CAPACITOR 6.3V 100U	2	
C547,548	ECEA1CU220	E.CAPACITOR 16V 22U	2	
C550-552	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C553,554	ECKT1H101KB	C.CAPACITOR 50V 100P	2	
C555,556	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C561,562	ECEA1CU220	E.CAPACITOR 16V 22U	2	
C563,564	ECEA1CN100S	E.CAPACITOR 16V 10U	2	
C565,566	ECEA1CPZ221	E.CAPACITOR 16V 220U	2	
C567-570	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	4	
C571-574	ECEA0JPZ221	E.CAPACITOR 6.3V 220U	4	
C575-578	ECUM1H103ZFN	C.CAPACITOR 50V 0.01U	4	
C579,580	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	2	
C602,603	ECEA0JK470	E.CAPACITOR 6.3V 47U	2	
C604,605	ECBT1E103ZF	C.CAPACITOR 25V 0.01U	2	
C652	ECBT1H102KB	C.CAPACITOR 50V 1000P	1	
C654	ECBT1H102KB	C.CAPACITOR 50V 1000P	1	
C655	ECEA1VK100B	E.CAPACITOR 35V 10U	1	
C656	ECBT1H102KB	C.CAPACITOR 50V 1000P	1	
C657	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C658	ECBT1E103ZF	C.CAPACITOR 25V 0.01U	1	
C659	ECEA1VK100	E.CAPACITOR 35V 10U	1	
C660	ECBT1E103ZF	C.CAPACITOR 25V 0.01U	1	
C694	ECBT1E103ZF	C.CAPACITOR 25V 0.01U	1	
C751	ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	

■REPLACEMENT PARTS LIST

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		INTEGRATED CIRCUIT(S)		
IC9	M5F78M12L	IC	1	<!>
IC10	M5F79M12L	IC	1	<!>
IC11	AN7812F	IC	1	<!>
IC12	AN7805F	IC	1	<!>
IC101	AN7030SE2	IC	1	
IC102	AN7035SCE2	IC	1	
IC201	MN6742SDR	IC	1	
IC202	MN5302OSDQ	IC	1	
IC203	AN8320NFA	IC	1	
IC204,205	AN3841SR	IC	2	
IC206	M5228FPE2	IC	1	
IC207	UPD74HC04GE2	IC	1	
IC208	MN4066BS	IC	1	
IC209	AN78L05ME2	IC	1	<!>
IC271	MN17541SDN2	IC	1	
IC272	AN6607NSE2	IC	1	
IC273	AN1339SE2	IC	1	
IC274	TA7291S	IC	1	
IC275	TC4S81F	IC	1	
IC301	MNE321RRAA2	IC	1	
IC302	MN6624	IC	1	
IC303	SRM2A256LM10	IC	1	
IC304	S22S12IF10	IC	1	
IC305	SM5843AS1	IC	1	
IC306,307	MC74HC273AF	IC	2	
IC308	UPD74HC74GE2	IC	1	
IC309	UPD74HC163G	IC	1	
IC310	MN1281-R	IC	1	
IC311	UPD74HC00G	IC	1	
IC312	T74HCU04AFTP	IC	1	
IC313	M5238FPE1	IC	1	
IC314	M5M34050F	IC	1	
IC315	T74HCU04AF	IC	1	
IC316	MC74HC125AF	IC	1	
IC317	MC74HC126AF	IC	1	
IC318	TORX178A	IC	1	
IC319	TOTX178	IC	1	
IC401-404	NJM4580ED	IC	4	
IC405	AK5339-VP	IC	1	
IC501,502	NJM5532DD	IC	2	
IC503,504	NJM4580ED	IC	2	
IC505,506	M5238FP	IC	2	
IC507,508	PCM1702P	IC	2	
IC551,552	M5218L	IC	2	
IC601	M50754-165FP	IC	1	
IC602	AN6873S	IC	1	
IC603	UPD74HC04G	IC	1	
		TRANSISTOR(S)		
Q11	2SB1238QSTV6	TRANSISTOR	1	<!>
Q21	2SC3311A-Q	TRANSISTOR	1	
Q22	2SA1309A-R	TRANSISTOR	1	
Q23	2SD2037DEF	TRANSISTOR	1	<!>
Q24	2SB1357DEF	TRANSISTOR	1	<!>
Q102-105	UN5216-Q	TRANSISTOR	4	
Q106,107	2SC3937	TRANSISTOR	2	
Q109	UN5216-Q	TRANSISTOR	1	
Q201	2SB956R	TRANSISTOR	1	
Q271	2SD1280-S	TRANSISTOR	1	
Q272	DTA123JK	TRANSISTOR	1	
Q274	2SB709-R	TRANSISTOR	1	
Q275	DTC124EK	TRANSISTOR	1	
Q276	DTB113ZK	TRANSISTOR	1	
Q277	DTA114EK	TRANSISTOR	1	
Q301	DTC124EU	TRANSISTOR	1	
Q302	DTA124EU	TRANSISTOR	1	
Q303	DTC124EU	TRANSISTOR	1	
Q304	2SC3931C	TRANSISTOR	1	
Q305	DTC124EU	TRANSISTOR	1	
Q401	UN4212	TRANSISTOR	1	
Q402	UN4112	TRANSISTOR	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q403-410	2SD1450R	TRANSISTOR	8	
Q501,502	2SC3311A-Q	TRANSISTOR	2	
Q503	UN4212TA	TRANSISTOR	1	
Q504-506	UN4112	TRANSISTOR	3	
Q551-554	2SD1450R	TRANSISTOR	4	
Q601-605	UN4111	TRANSISTOR	5	
		DIODE(S)		
D11-20	1SR35200TB	DIODE	10	<!>
D21	MTZJ27D	DIODE	1	<!>
D22	MTZJ3R9A	DIODE	1	<!>
D23,24	MA4056M	DIODE	2	<!>
D25	MTZJ3R9A	DIODE	1	<!>
D201	MA701	DIODE	1	
D203	1N4606TR	DIODE	1	
D204	MA151A	DIODE	1	
D271	1S2473TR	DIODE	1	
D301-305	MA110	DIODE	5	
D306	RVDSVC321	DIODE	1	
D311-318	MA8056M	DIODE	8	
D321-324	MA165	DIODE	4	
D401,402	MA719	DIODE	2	
D403-410	MA165	DIODE	8	
D501,502	MA165	DIODE	2	
D503,504	MA719	DIODE	2	
D505,506	MA165	DIODE	2	
D507,508	MA719	DIODE	2	
D509	MA165	DIODE	1	
D601-603	LN28RCPP-JF	DIODE	3	
D605	LN31GPH-JF2	DIODE	1	
D607	LN49YPH-JF1	DIODE	1	
D608	LN29RPH-JF1	DIODE	1	
D611-628	MA165	DIODE	18	
D630-635	MA165	DIODE	6	
D637-643	MA165	DIODE	7	
D790	MA165	DIODE	1	
D2001,2002	MA165	DIODE	2	
		VARIABLE RESISTOR(S)		
VR104,105	EVNDXAA00B53	VARIABLE RESISTOR	2	
VR106	EVNDXAA00B14	VARIABLE RESISTOR	1	
VR107,108	EVNDXAA00B13	VARIABLE RESISTOR	2	
VR201	EVNDXAA00B54	VARIABLE RESISTOR	1	
VR271	EVNDCAA03B54	VARIABLE RESISTOR	1	
VR401,402	EVJC20F03A24	VARIABLE RESISTOR	2	
VR551	EVU57A022A14	VARIABLE RESISTOR	1	
VR601	EVQWS00004E	VARIABLE RESISTOR	1	
		COMPONENT COMBINATION(S)		
Z301,302	EXCEMT471B	COMBINATION PART	2	
		COIL(S)		
L1,2	RLZ0026-0	COIL	2	<!>
L101	ELJFA470KF	COIL	1	
L104	ELJFA180KF	COIL	1	
L106	ELJFA101KF	COIL	1	
L108	RLQZB471KT-D	COIL	1	
L109,110	ELJFA180KF	COIL	2	
L120	RLQZB101KT-D	COIL	1	
L202	RLM9R001-Z	COIL	1	
L203	RLQZB101KT-D	COIL	1	
L301	EXCELDR35V	COMBINATION PART	1	
L301	RLQZB2R2KT-D	COIL	1	
L302	RLO3B002-M	COIL	1	
L303	ELEXT470KA9	COIL	1	
L401-404	EXCELDR35	COMBINATION PART	4	
L501-504	EXCELDR35	COMBINATION PART	4	
L550-552	EXCELDR35	COMBINATION PART	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		TRANSFORMER(S)		
T1	RTP1L4B001	POWER TRANSFORMER	1	<!>
T301	RLZ0006-0	TRANSFORMER	1	
		OSCILLATOR(S)		
X201	RSXC8M00J01	OSCILLATOR	1	
X202	RSXY8M00M01	OSCILLATOR	1	
X301	RSXY8M00M01	OSCILLATOR	1	
X302	RSXC28M2S01	OSCILLATOR	1	
X303	RSXC24M5S03	OSCILLATOR	1	
X304	RSXC22M5S01	OSCILLATOR	1	
X305	RSXC16M3S01	OSCILLATOR	1	
X601	RSXY6M00M01	OSCILLATOR	1	
		DISPLAY TUBE		
FL601	RSL0062-F	DISPLAY TUBE	1	
		SWITCH(ES)		
S1	ESB8249V	POWER	1	<!>
S601	ESD1511201	SAMPLING FREQ	1	
S602	ESB64805	INPUT(ANALOG/DIGITAL)	1	
S611-628	EVQQTG05R	SWITCH	18	
S630-635	EVQQTG05R	SWITCH	6	
S751,752	SSPD18	SWITCH	2	
		JACK(S)		
JK1	SJVD06	AC INLET	1	
JK301	RJS1A9803-R	AES/EBU REC IN	1	
JK301A	QJS1955H	REMOTE CONTROL	1	
JK302	RJS1A9703-R	DIGITAL AES/EBU PLAY OUT	1	
JK303	SJFD7	IEC TYPE2 REC IN	1	
JK304	SJFD7	IEC TYPE2 PLAY OUT	1	
JK401	RJS1A9703-R	ANALOG REC IN(L)	1	
JK402	RJS1A9703-R	ANALOG REC IN(R)	1	
JK501	RJS1A9803-R	ANALOG PLAY OUT(L)	1	
JK502	RJS1A9803-R	ANALOG PLAY OUT(R)	1	
JK550	SJJD19	HEADPHONES	1	
		CONNECTOR(S)		
CN1	RHR197ZA	CONNECTOR(10P)	1	
CN2	SJSD1005	CONNECTOR(10P)	1	
CN7	RJS6T4ZA	CONNECTOR(6P)	1	
CN9	REZ0121A	CONNECTOR(6P)	1	
CN10	RJP6G27ZA	CONNECTOR(6P)	1	
CN15	RJS6T4ZA	CONNECTOR(6P)	1	
CN16	RHR193ZA	CONNECTOR(6P)	1	
CN21,22	RJS6Q8ZA	CONNECTOR(6P)	2	
CN29	RJS5T7ZA	CONNECTOR(5P)	1	
CN41	RJP10G27ZA	CONNECTOR(10P)	1	
CN43	RJS1A6717-Q	CONNECTOR(17P)	1	
CN44	SJSD1721	CONNECTOR(17P)	1	
CN45	RJP5G27ZA	CONNECTOR(5P)	1	
CN51	RJP3G27ZA	CONNECTOR(3P)	1	
CN52-54	RJS1A6315	CONNECTOR(15P)	3	
CN56	RJP4G28ZA	CONNECTOR(4P)	1	
CN57	RJP6G28ZA	CONNECTOR(6P)	1	
CN58	RJT036W002	CONNECTOR(2P)	1	
CN62	RJS7Q11ZA	CONNECTOR(7P)	1	
CN301,302	RJU057W012	CONNECTOR(12P)	2	
CN303,304	RJT057W012	CONNECTOR(12P)	2	
		FUSE HOLDER(S)		
FC1,2	EYF52BC	FUSE HOLDER	2	<!>
		CONNECT.ASS'Y & FLAT CABLE		
JCN1	RWJ4310150QQ	FLAT CABLE(10P)	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
JCN8	RWJ6506230KQ	FLAT CABLE(6P)	1	
JCN16	REZ0693	CONNECTOR ASS'Y(6P)	1	
JCN30	RWJ6505350KQ	FLAT CABLE(5P)	1	
JCN31	RWJ6505070KK	FLAT CABLE(5P)	1	
JCN42	REZ0125A	CONNECTOR ASS'Y(10P)	1	
JCN46	REZ0126A	CONNECTOR ASS'Y(5P)	1	
JCN56	REZ0127A	CONNECTOR ASS'Y(6P)	1	
JCN70	RWJ4302200KK	FLAT CABLE(2P)	1	
W1,W2	REZ0123A	CONNECTOR ASS'Y(1P)	1	
W3	REZ0124B	CONNECTOR ASS'Y(1P)	1	
W4	REZ0237A	CONNECTOR ASS'Y(1P)	1	
		RELAY(S)		
RL501,502	RSY0020M-R	RELAY	2	
		REMOTE SENSOR		
RM601	RCDHC-212	REMOTE SENSOR	1	
		FUSE(S)		
F1	XBA2C02TB0S	FUSE 250V, 0.2A	1	<!>

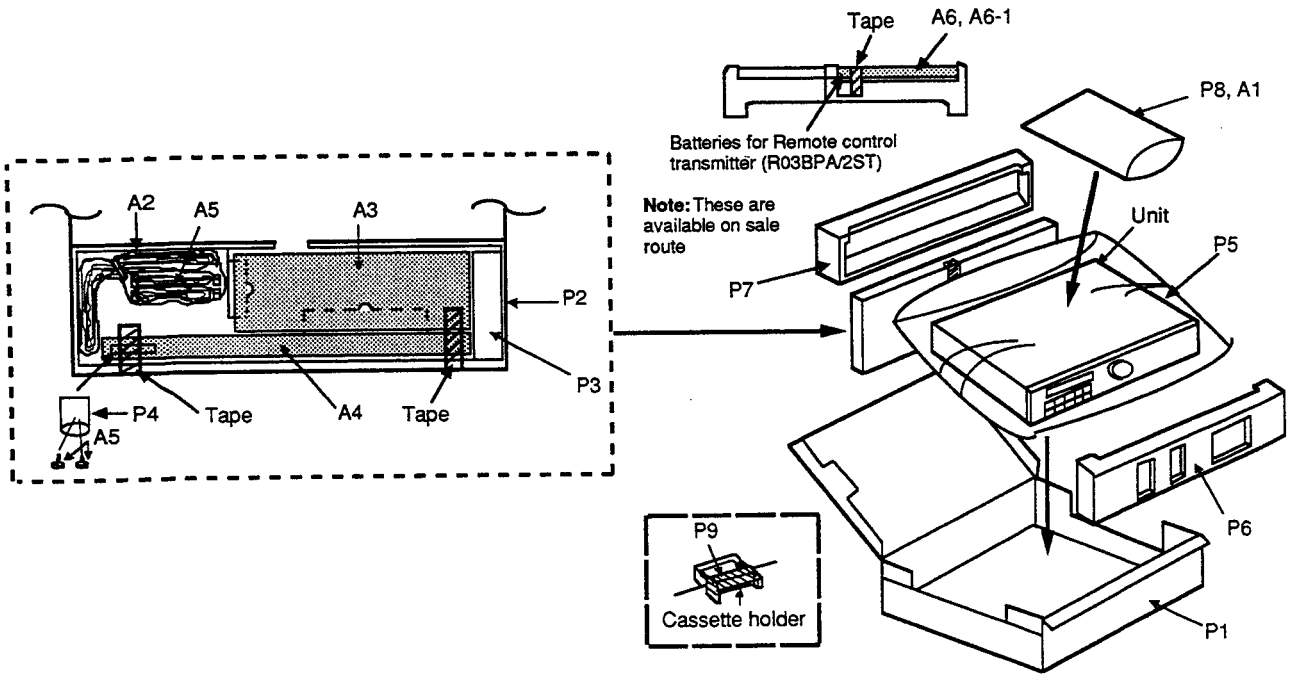
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		CABINET AND CHASSIS		
1	RMA0202	FL HOLDER	2	
2	REZ0135A	CONNECTOR ASS'Y(1P)	1	
3	REZ0136A	FFC(6P)	1	
4	RGU0235A-H	OPERATION(A) BUTTON	1	
5	RGU0236-H	OPERATION(B) BUTTON	1	
6	RGU0237-H	OPERATION(C) BUTTON	1	
7	RGU0238	INPUT SELECTOR BUTTON	1	
8	RGV0033	SAMPLING FREQ.SELECTOR KNOB	1	
9	RGW0055	H.P/BALANCE/REC LEVEL KNOB	3	
10	RMA0192	HEADPHONES ANGLE	1	
11	RMA0193	BALANCE&REC LEVEL ANGLE	1	
12	RFKGV3800P-H	FRONT PANEL ASS'Y	1	
13	RFKNV3700PH	SHUTTLE KNOB ASS'Y	1	
14	CSTW-2	RING	2	
15	SHRD202	RESIN PARTS	1	
16	SHR9451	NYLON STOPPER	1	
17	SUSD162	SPRING	1	
18	XNS12	NUT	1	
19	XNS7S	NUT	1	
20	XNS8S	NUT	1	
21	XNS9	NUT	2	
22	XTBS3+8JFZ	SCREW	18	
23	XTB3+10GFR	SCREW	10	
24	XTB3+8GFR	SCREW	5	
25	XTB3+8J	SCREW	5	
26	XWC3B	WASHER	2	
27	RMA0408	REMOTE CONTROL ANGLE	1	
28	REZ0137B	FFC(17P)	1	
29	RGK0165C-H	TRAY ORNAMENT	1	
30	RGQ0046	WIRE SADDLE	1	
31	RGR0235A-B	REAR PANEL ASS'Y	1	
32	RGU0030A	POWER BUTTON	1	
33	RHD30068	SCREW	2	
34	RKA0053-K	FOOT	4	
35	RKF0089	BOTTOM PLATE	1	
36	RKM0076-H1	CABINET	1	
37	RMK0068	CHASSIS	1	
38	RMN0203	P.C.B. HOLDER	1	
39	RMZ0096	INSULATION SHEET(A)	1	
40	RMZ0356	INSULATION SHEET(B)	2	
41	RQCS0015	CAUTION LABEL	1	
42	SHD04	SCREW	4	
43	SHE181	P.C.B. SUPPORT	5	
44	SHRD16	P.C.B. SPACER	4	
45	SHR9815	RIVET	2	
46	SNE2095	SCREW	4	
47	XSN3+6FZ	SCREW	12	
48	XTBS3+8FFZ	SCREW	4	
49	XTB3+20JFR	SCREW	5	
50	XTB3+6F	SCREW	1	
51	XTB4+8F	SCREW	3	
52	XTV3+6G	SCREW	4	
53	XWC4B	WASHER	2	
54	YD20020417A	CONNECTOR ASS'Y (1P)	1	
55	RMG0134	MECHANISM SUPPORT	4	
56	SHR330	BINDER	1	
57	RMA0988	REINFORCING PLATE	2	
58	XWA4B	WASHER	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		MECHANISM PARTS		
101	EVQMR4002	CASSETTE SW.	1	
102	QBW2008	WASHER	6	
103	QBW2030	WASHER	1	
104	QBW2059	WASHER	11	
105	RDG0066	MAIN GEAR(A)	1	
106	RDG0067	MAIN GEAR(B)	1	
107	RDG0068	IDLER GEAR(P)	1	
108	RDG0069	IDLER GEAR(F)	1	
109	RDG0070	COUNTER GEAR	1	
110	RDG0073	MODE REPEATING GEAR	1	
111	RDK0006	LOAD CAM	1	
112	RDK0007	MODE CAM	1	
113	RDP0020	FIXED POST	1	
114	RDP0021	FIXED POST PLATE	1	
115	REM0001	CAPSTAN UNIT	1	
116	REM0009	MODE MOTOR ASS'Y	1	
117	RMN0028	MODE MOTOR HOLDER	1	
118	REQ0012	INTERFACE P.C.B.	1	
119	REQ0014	BEGIN/END DET.SENSOR ASS'Y	2	
120	RMN0030	BEGIN DET.ANGLE	1	
122	RMN0029	END DET.ANGLE	1	
123	RMQ0059	LEAD OPENER	1	
124	REQ0018	BEGIN/END DET.LED ASS'Y	1	
125	EVQWXN001	LOAD SW ASS'Y	1	
126	EVQWXM001	MODE SW ASS'Y	1	
127	RMB0061	FIXED POST SPRING	1	
128	RMB0063	GUIDE ROLLER SPRING	1	
129	RMB0071	S.REEL SPRING	1	
130	RMB0073	T.REEL SPRING	1	
131	RMB0074	TENSION SPRING	1	
132	RMB0075	BRAKE SPRING	1	
133	RMC0034	ANGLE	1	
134	RME0037	BT SPRING	1	
135	RML0088	PINCH LEVER	1	
136	RML0090	TENSION LEVER	1	
137	RML0094	S.BRAKE LEVER	1	
138	RML0095	T.BRAKE LEVER	1	
139	RML0103	LOAD SELECT LEVER	1	
140	RMQ0052	S.STOPPER	1	
141	RMQ0053	T.STOPPER	1	
142	RMQ0055	LOAD GUIDE HOLDER	1	
143	RMQ0056	GUIDE ARM STOPPER	1	
144	RMQ0058	MODE GUIDE PLATE	1	
145	RMQ0062	IDLER GUIDE	1	
146	RMQ0063	TENSION SPRING HOOK	1	
147	RMQ0064	S.BRAKE DRIVE PLATE	1	
148	RMQ0065	T.BRAKE DRIVE PLATE	1	
149	RNW172ZA	WASHER	2	
150	RUS740ZA	EARTH ANGLE	1	
151	RDG0071	IDLER GEAR	1	
152	RMB0069	IDLER SPRING	1	
153	RXL0051	IDLER ARM ASS'Y	1	
154	RXG0011	DRIVE GEAR	1	
155	RXK0019	CHASSIS UNIT	1	
156	RXL0035	TENSION ARM ASS'Y	1	
157	RXL0036	TENSION BAND ASS'Y	1	
158	RMB0066	PIN PRESSURE SPRING	1	
159	RMB0067	PINCH ROLLER SPRING	1	
160	RMM0036	PIN PRESSURE LINK	1	
161	RXL0046	PINCH ARM ASS'Y	1	
162	RXL0048	BT LEVER ASS'Y	1	
163	RXL0049	S.BRAKE ASS'Y	1	
164	RXL0050	T.BRAKE ASS'Y	1	
165	RXL0052	S.LOAD ARM	1	
166	RXL0054	T.LOAD ARM	1	
167	RXL0056	LOAD LEVER	1	
168	RXL0057	P.F.IDLER ASS'Y	1	
169	RXL0058	P.F.SELECT LEVER	1	
170	RXM0018	GUIDE LINK ASS'Y	1	
171	RXM0019	PLUNGER LINK ASS'Y	1	
172	RXP0016	S.POST ROLLER ASS'Y	1	
172-1	RXP0008	POST ROLLER	1	

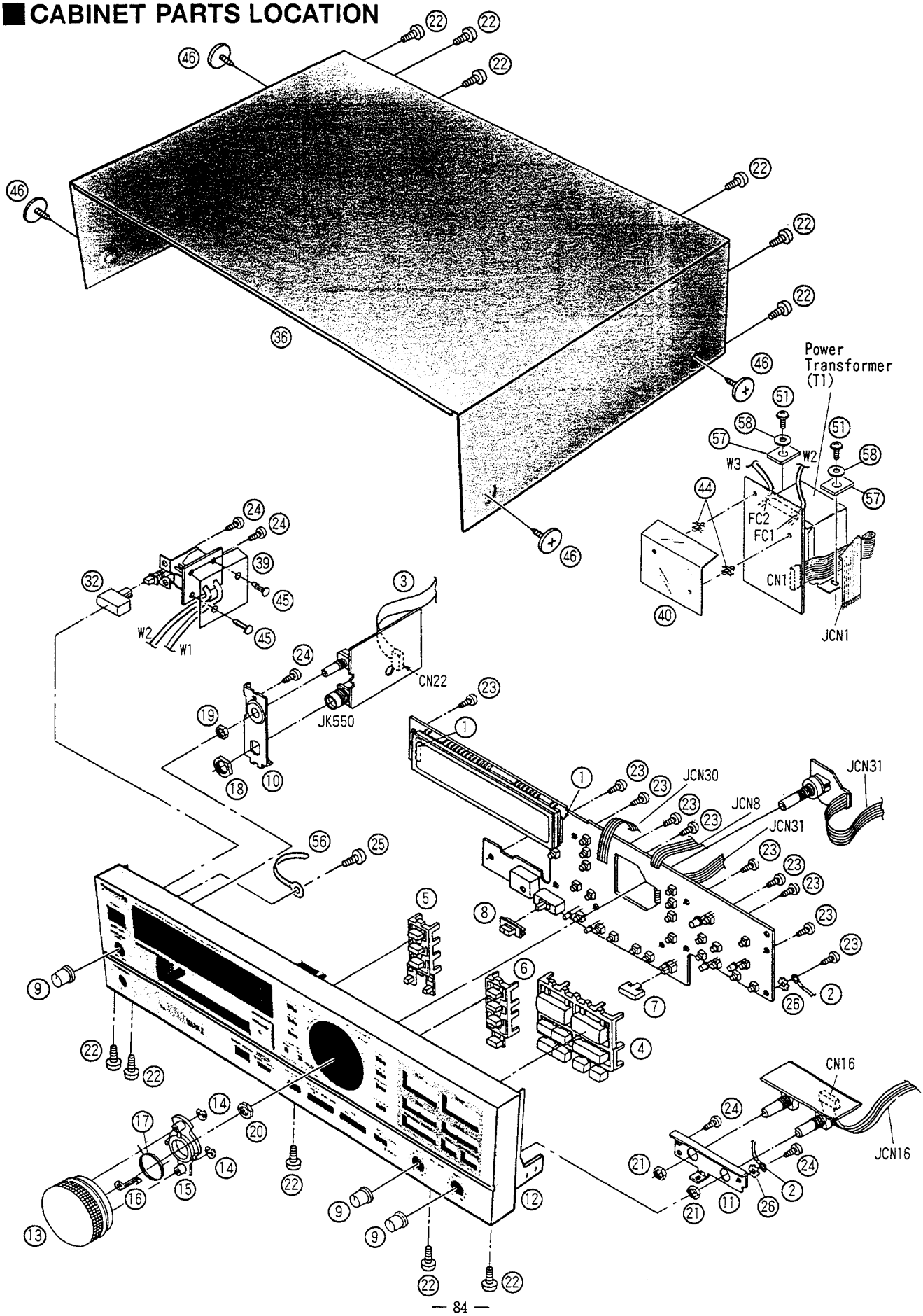
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
173	RXP0017	T.POST ROLLER ASS'Y	1	
173-1	RXP0008	POST ROLLER	1	
174	RXP0020	T.GUIDE ROLLER	1	
175	RXQ0057	T.INCLINED BASE ASS'Y	1	
176	RXQ0079	LOAD HOLDER ASS'Y	1	
177	RXR0006	S.REEL ASS'Y	1	
178	RXR0007	T.REEL ASS'Y	1	
179	VEG0752	CYLINDER UNIT	1	
179-1	VEH0460	UPPER CYLINDER	1	
179-2	VHD0593	SCREW	2	
180	RSJ0006	PLUNGER	1	
181	QBW2081A	WASHER	3	
182	RXP0031	S.GUIDE ROLLER ASS'Y	1	
183	RHW12009	GUIDE WASHER	1	
184	XQN14+C16	SCREW	2	
185	RHQ0014	SCREW	13	
186	RHQ0007	SCREW	6	
187	RHQ0015	SCREW	1	
188	RHQ0016	SCREW	4	
189	RHQ0017	SCREW	3	
190	XQN16+A45T	SCREW	3	
191	XQN2+A2	SCREW	1	
192	RHQ0018	SCREW	1	
193	RHQ0019	SCREW	1	
194	RHQ0020	SCREW	3	
195	QHQ1371	SCREW	2	
		LOADING PARTS		
201	RFKPVDA10-K	MOTOR ASS'Y(M751)	1	
202	RDB0032	GEAR SHAFT HOLDER	2	
203	RDG0120	MAIN GEAR(R)	1	
204	RDG0122	MAIN GEAR(L)	1	
205	RFKNVDA10BK	GEAR SHAFT ASS'Y	1	
206	RJP2G27ZA	CONNECTOR(CN72)(2P)	1	
207	RMA0194	SHAFT FRAME	1	
208	RMA0197	CASSETTE HOLDER ANGLE	1	
209	RMA0200	HOLDER ARM	2	
210	RMB0110	SPRING	2	
211	RMB0111	SPRING	1	
212	RMB0131	SPRING	1	
213	RMB0144	SPRING	1	
214	RMC0050	ANGLE(L)	1	
215	RMC0051	ANGLE(R)	1	
216	RMG0090	RUBBER	2	
217	RML0139	SHAFT HOLDER(R)	1	
218	RML0140	HOLDER(R)	1	
219	RML0141	SHAFT HOLDER(L)	1	
220	RML0142	HOLDER(R)	1	
221	RML0150	MAIN GEAR HOLDER	1	
222	RMR0206	TRAY	1	
223	RMR0207	CASSETTE HOLDER	1	
224	RMR0209	SHAFT ANGLE	1	
225	RMS0158	SHAFT	1	
226	RMS0160	SHAFT	1	
227	RMS0165	SHAFT	1	
228	RXA0046	SUB FRAME	1	
229	RXA0047	CASSETTE HOLDER	1	
230	RXK0059	FRAME	1	
231	SMQ20025	BELT	1	
232	SMQ40032	PULLEY GEAR	1	
233	EYHS78R	DEW SENSOR	1	
234	SHE36	EARTH TERMINAL	1	
235	RSC0066	SHIELD PLATE	1	
236	RXA0060	MECHANISM FRAME	1	
237	RMX0044	WASHER	1	
238	XSS26+4FZ	SCREW	4	
239	XTB3+6J	SCREW	7	
240	XTN3+10G	SCREW	2	
241	XTN3+6B	SCREW	3	
242	XUC15FT	WASHER	2	
243	XUC2FT	WASHER	2	
244	XUC3FT	WASHER	3	
245	XYN26+C33	SCREW	2	
246	XTB3+6F	SCREW	4	

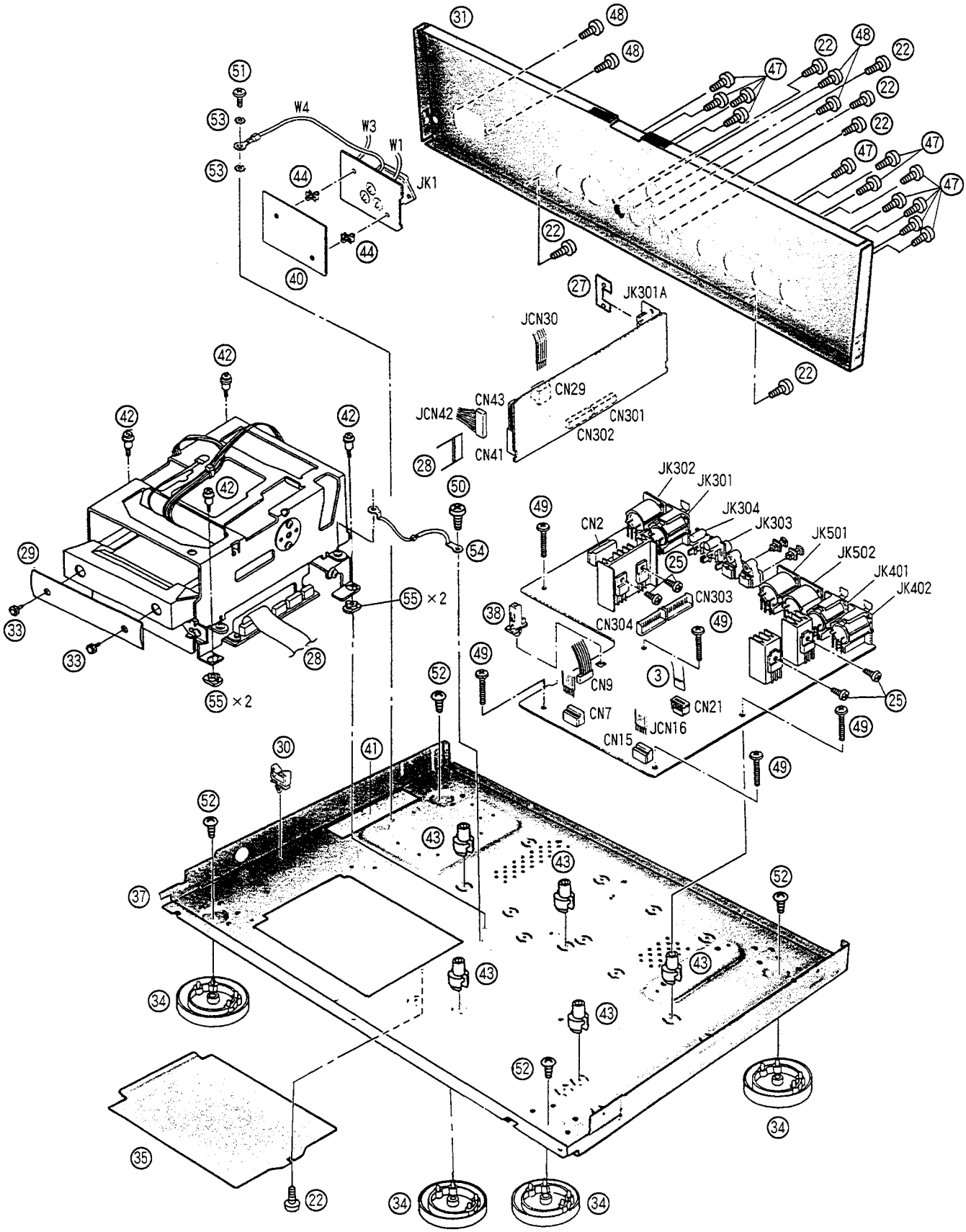
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
247	XTN3+8F	SCREW	4	
248	XSN2+3	SCREW	2	
		PACKING MATERIAL		
P1	RPG2764	PACKING CASE	1	
P2	RPN0391	ACCESSORIES BOX	1	
P3	RPN0392	PAD(ACCESSORIES)	1	
P4	XZB09X10C03	PROTECTION BAG(SCREW)	1	
P5	RPF0017	PROTECTION BAG(NUIT)	1	
P6	RPN0221	PAD(FRONT)	1	
P7	RPN0222	PAD(BACK)	1	
P8	XZB25X34C03X	PROTECTION BAG(F.B)	1	
P9	RPH0065	SOFT SHEET	1	
		ACCESSORIES		
A1	RQF3077	INSTRUCTION MANUAL	1	
A2	RJA0003	AC POWER SUPPLY CORD	1	<!>(SF)
A3	RYQ0059	RACK EARS	1	
A4	RYQ0060	RACK PANELS	1	
A5	XYN3+F10FZ	SCREWS	8	
A6	RAK-SV012WH	REMOTE CONTROL TRANSMITTER	1	
A6-1	RKK0020-K	BATTERY COVER	1	FOR R/C TRANSMITTER
		<GREASE OR JIG/TOOL>		
		TEST TAPE		
SA1	RD-PG01	PG REFERENCE TAPE	1	
SA2	RD-ER01	ERROR RATE TAPE	1	
SA3	RD-LR02	LINEARITY ADJ.TAPE	1	
		DRIVER		
SA4	SZZV1102C	POST ROLLER ADJ.SCREWDRIVER	1	
		GREASE		
SA5	RFKX0002	COMPOUND GREASE	1	
SA6	RZZ0L05	DYNAMIC GREASE	1	
		<PRINTED CIRCUIT BOARDS ASS'Y>		
PCB1	REP0694C	OPERATION P.C.B. ASS'Y	1	<RTL>
PCB2	REP2246A	MAIN P.C.B.ASS'Y	1	<RTL>
PCB3	REP2247A	DIGITAL P.C.B.ASS'Y	1	<RTL>
PCB4	REP0417A	RF/SERVO P.C.B.ASS'Y	1	<RTL>
PCB5	REP0421A	TRAY MOTOR/SW P.C.B.ASS'Y	1	<RTL>
		<MECHANISM ASS'Y>		
MECH1	RAA1001	MECHANISM UNIT	1	

■PACKAGING

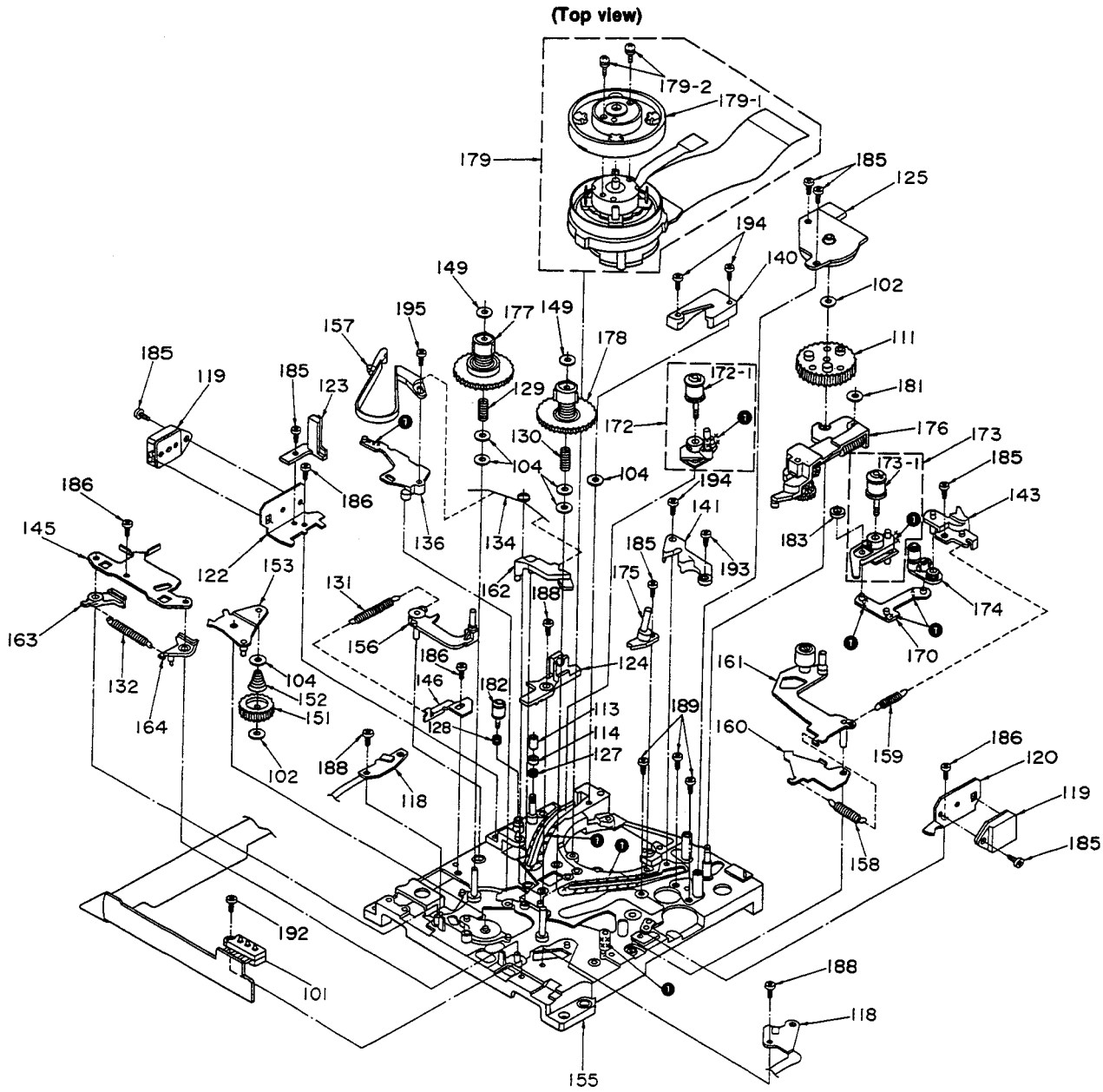

A2
A5
A3
P2
P3
P4
Tape
A4
Tape
A5
Tape
A6, A6-1
Batteries for Remote control transmitter (R03BPA/2ST)
Note: These are available on sale route
P8, A1
Unit
P5
P7
P6
P9
Cassette holder
P1

■CABINET PARTS LOCATION



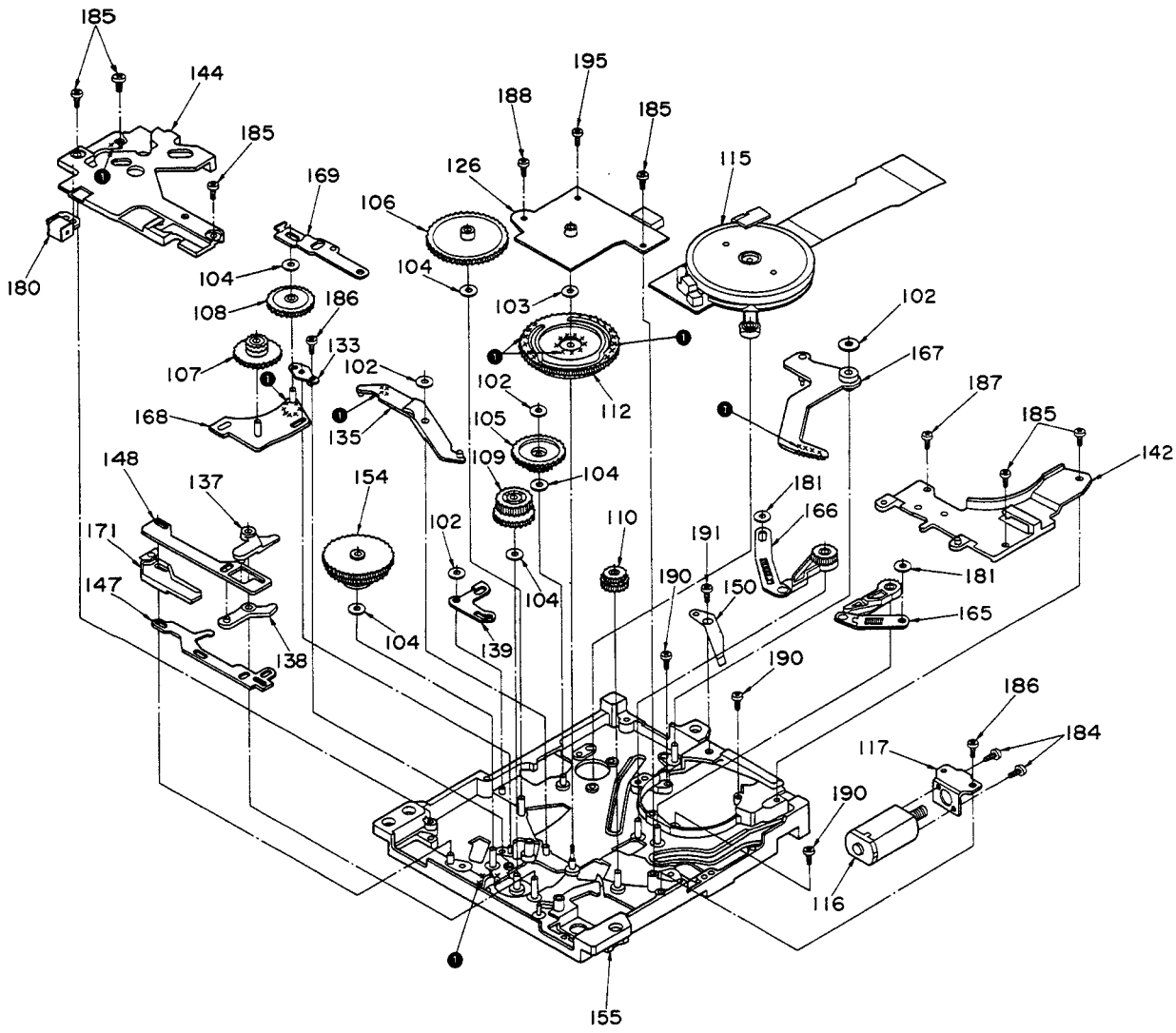

W4
W3
W1
JK1
JK301A
JCN30
CN29
CN43
JCN42
CN301
CN302
CN41
JK302
JK301
JK304
JK303
JK501
JK502
JK401
JK402
CN2
CN303
CN304
CN9
CN7
CN21
JCN16
CN15
×2
×2

■MECHANISM PARTS LOCATION



5 6 7 8

(Bottom view)



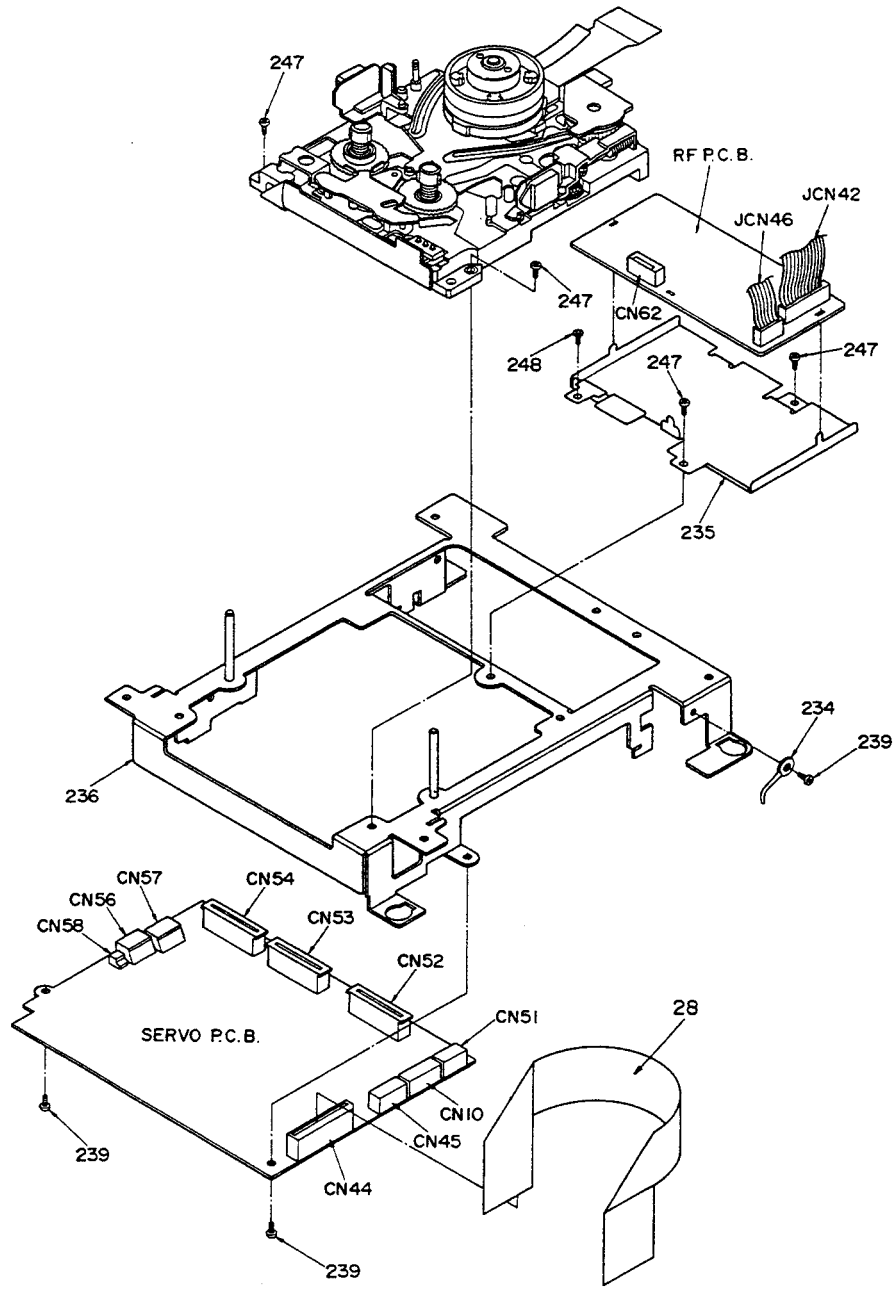
Note: When changing mechanism parts, apply the specified grease to the areas marked "XX" as shown in the drawing.

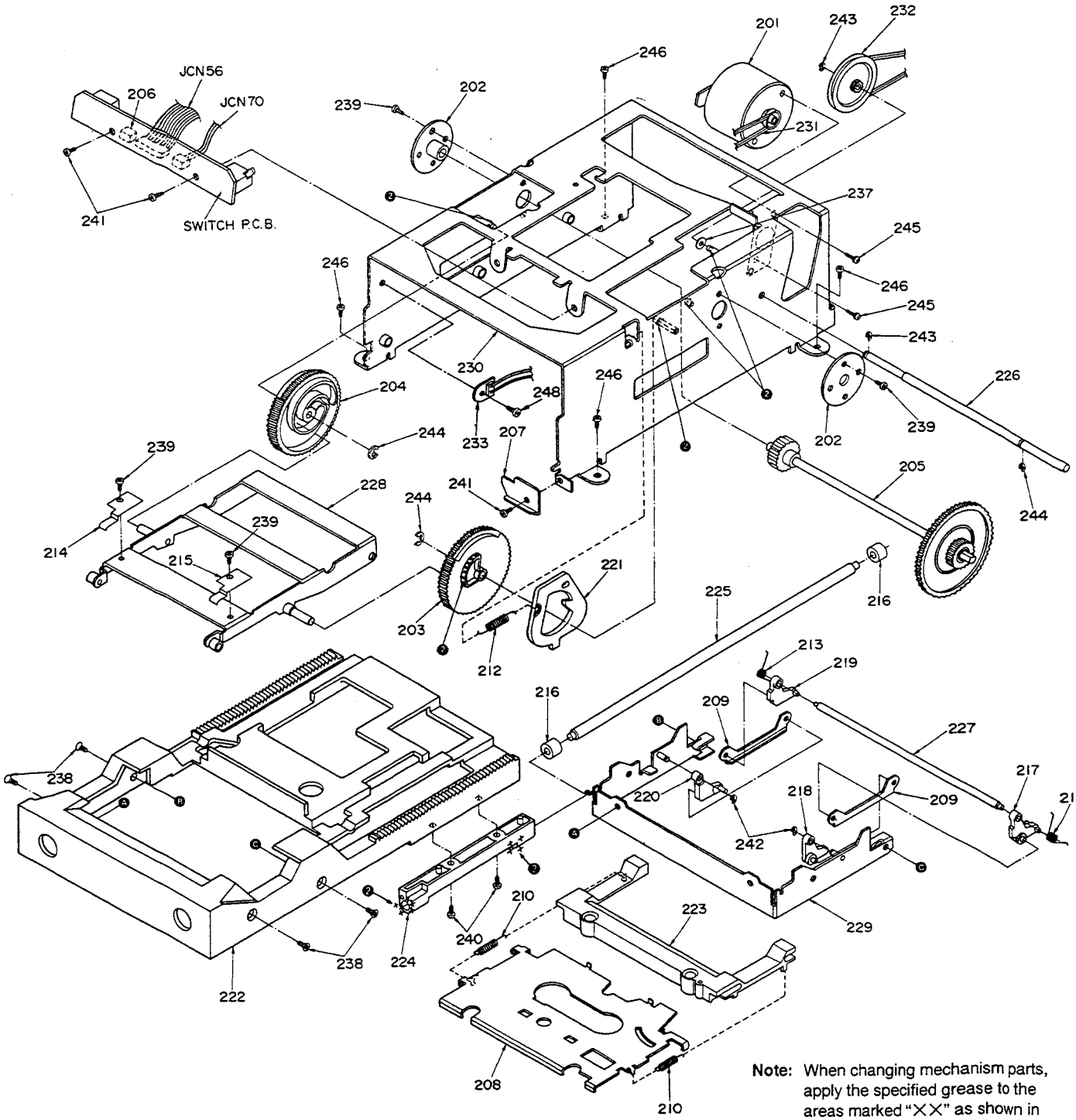
Ref. No.	Part No.
❶	RZZ0L05

1 2 3 4

A B C D E F

■LOADING PARTS LOCATION





Note: When changing mechanism parts, apply the specified grease to the areas marked "XX" as shown in the drawing.

Ref. No.	Part No.
❷	RFKX0002

7924 2 36 073

! Warning

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advice non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service manual by anyone else could result in serious injury or death.

Order No. VSD9806SK01
D13,A0

Service Manual

Supplement

NTSC/PAL **DAT Product**

Subject : Tension Arm Adjustment Procedures

Please use this supplement together with the Service Manual as follows :

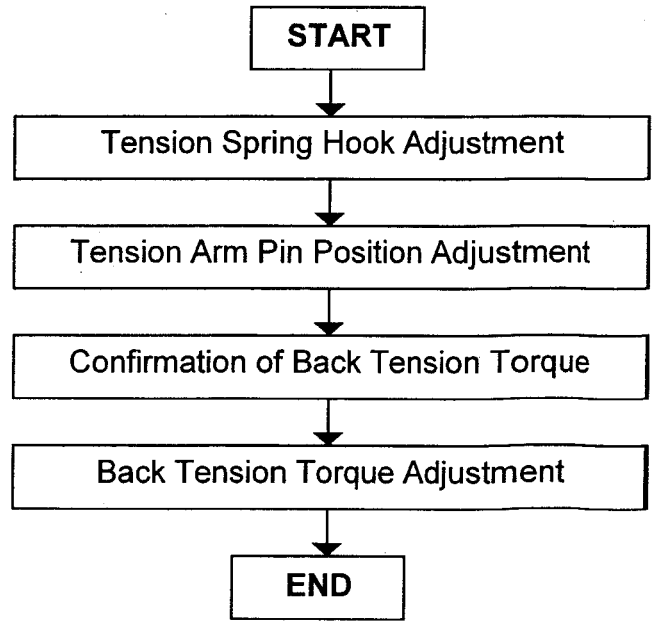
Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	6	AD9007236C1	First Product
SV-4100P-H	6	AD9407220C1	First Product
SV-3800P-H	7	AD9511220C1	First Product
SV-3900PP-H	7	AD9010279C1	First Product
SV-3700EB-H/EG-H	3	AD9010314C2	First Product
SV-4100EB-H/EG-H	3	AD9409253C2	First Product
SV-3800E-H/EB-H	3	VSD9602MK01	First Product
SV-3900EB-H/EG-H	4	AD9101007C2	First Product

1. Cassette Type Reel Torque Meter

To perform the Tension Arm Adjustment (Tape Tension) as the factory specification, Cassette Type Reel Torque Gauge (VFK1430 or TW-7131) is needed.
The VFK1430 has been introduced as replacement of TW-7131.

2. Tension Arm Adjustment

The following flow chart shows the Tension Arm Adjustment steps.



TC2-0887,TC2-0872

Panasonic

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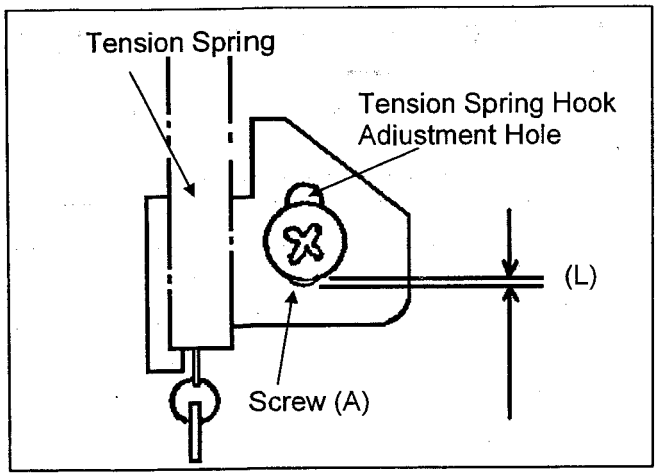
3. Tension Arm Adjustment Procedures

3-1. Tension Spring Hook Adjustment

1. Tighten the screw (A) so that the clearance (L) between Tension Spring Hook Adjustment hole and the screw (A) is 0 mm as shown in figure 1.

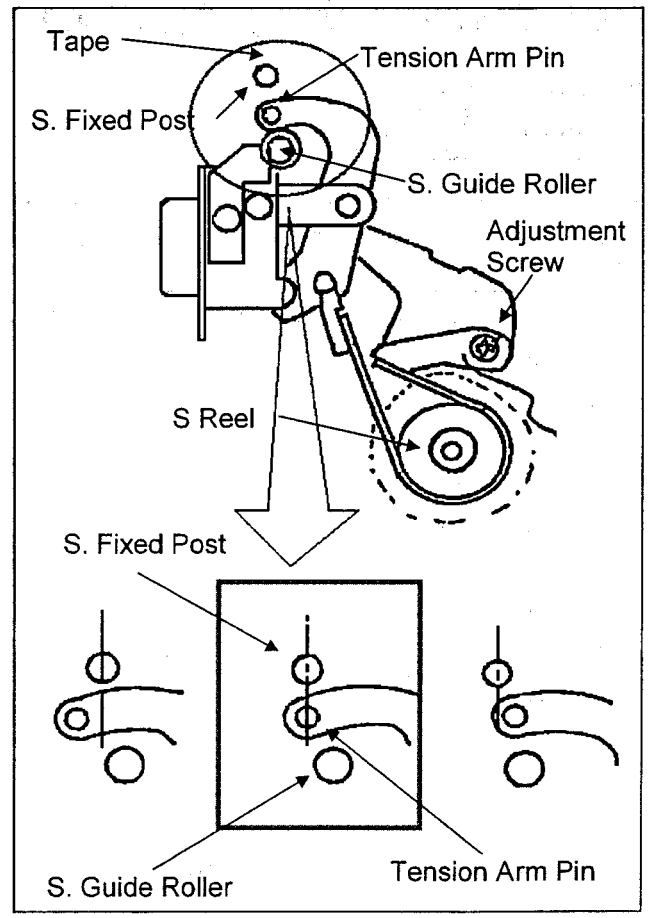


3-2. Tension Arm Pin Position Adjustment

1. Blind the End/Begin Detect Sensor by the black tape.
2. Press the cassette switch ON by finger and push the PLAY button without cassette tape. The unit goes to Loading mode.
3. Confirm the center position of S. Fixed Post and Tension Arm Pin.
4. If the center position is shifted, press the EJECT button and the unit goes to unloading mode.
5. Loosen the Adjustment Screw and adjust it and press the cassette switch ON by finger and push the PLAY button without cassette tape.
6. Confirm that the Tension Arm Pin should be aligned to the S. Fixed Post as shown below.
7. If the center position is shifted, repeat the above steps 4, 5 and 6.
8. Tighten the adjustment screw (A).

3-3. Confirmation of Back Tension Torque

1. Place the Cassette Type Torque Meter VFK1430 or TW-7131 on the recorder.
2. Place the recorder in the Playback mode so that



the Torque Meter at the Supply Reel side indicates 5.5 ± 1.5 g.cm.

Tool	Torque Meter VFK1430 orTW-7131
Mode	Playback mode
Spec.	5.5 ± 1.5 g.cm (measured by Supply Reel)

3-4. Back Tension Torque Adjustment

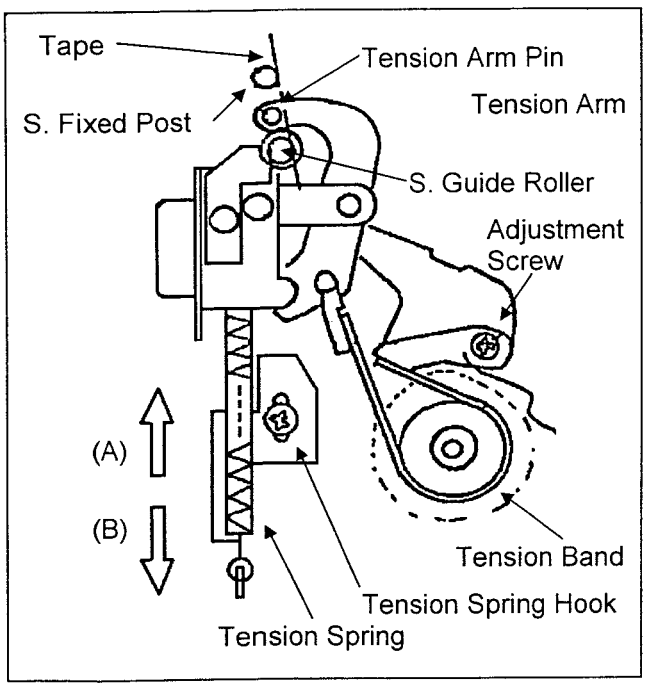
1. If the Back Tension torque is out of specification, the following adjustments are required.

< Back tension torque is more than specification >

1. Slide the Tension Spring Hook Plate to an arrow direction (A) and then confirm the Back Tension torque.

< Back tension torque is less than specification >

1. Slide the Tension Spring Hook Plate to an arrow direction (B) and then confirm the Back Tension torque.



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! Warning
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advice non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service manual by anyone else could result in serious injury or death.

Order No. VSD9806SK04
D13

Service Manual

Supplement

NTSC/PAL **DAT Product**

Subject : Change of OPEN/CLOSE Switch

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	8	AD9007236C1	F8-----
SV-4100P-H	9	AD9407220C1	F8-----
SV-3800P-H	9	AD9511260C1	F8-----
SV-3900PP-H	9	AD9010279C1	F8-----
SV-3700EB/EG-H	5	AD9010314C2	F8-----
SV-4100EB/EG-H	6	AD9409253C2	F8-----
SV-3800E-H/EB-H	5	VSD9602MK01	F8-----
SV-3100EB-H/EG-H	6	AD9101007C2	F8-----

Reason for Change

- ☐ The following part(s) has(have) been changed for serviceability improvement.
- ☐ The following part(s) has(have) been changed for productivity improvement.
- ■ The following part(s) has(have) been changed for standardization.
- ☐ The following part(s) has (have) been changed for the safety regulation.
- ☐

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
S751,752	SSPD18	VSS0566	SWITCH	2		

TDM201608TC20907

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Order No. VSD9806SK02
D13,A0

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Service Manual

Supplement

NTSC / PAL **DAT Product**

Subject : Addition of Tape Protectors

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	7	AD9007236C1	E8----
SV-4100P-H	7	AD9407220C1	E8----
SV-3800P-H	8	AD9511260C1	E8----
SV-3900PP-H	8	AD9010279C1	E8----
SV-3700EB-H/EG-H	4	AD9010314C2	E8----
SV-4100EB-H/EG-H	4	AD9409253C2	E8----
SV-3800E-H/EB-H	4	VSD9602MK01	E8----
SV-3900EB-H/EG-H	5	AD9101007C2	E8----

Mechanism Part Section

Symptom : The deck dose not perform tape loading or reverse playback in the very low probability.

Cause : Tape loosing may occur in the case of loading completion and grease adheres to the tape.

Remedy :
1. To keep the proper tension of the guide arm, the guide arm spring has been changed as shown figure 1 on the reverse page.
2. To prevent tape loosing after completion of the tape loading, a washer has been added as shown in figure 1 on the reverse page.
3. To prevent any tape damage and grease adhesion to the tape, 3 pcs of tape protector have been added at the S. post, T. post and LED holder as shown on the reverse page.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
301	----	VMA0A51	S TAPE PROTECTOR	1	E	
302	----	VMA0A53	T. TAPE PROTECTOR	1	E	
303	----	VMA0A53	TAPE STOPPER	1	E	
304	----	VMB3276	GUIDE ARM SPRING	1	E	
305	----	XWGV2Z4G	WASHER	1	E	

TC2-0903

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Installation Procedure

1. S. Tape Protector

1. Place the unit in the unloading completion condition.
2. Unscrew the screw.(194)-1.
3. Install the S tape protector on the S. stopper as shown in figure 1 and tighten the screw (194).
   When tightening the screw make sure that the portion (X) of the S. tape protector touched with the side surface of the S. stopper as shown figure 1.

2. T. Tape Protector

1. Place the unit in the unloading completion condition.
2. Unscrew the screw (194)-2.
3. Install the T. tape protector on the T. stopper as shown in figure and tighten the screw (194).
   When tightening the screw make sure that the portion (Y) of the T. tape protector touched with the shaft as shown in figure 1.

3. Tape Stopper

1. Unscrew the screw (188).
2. Slightly lift the LED holder and install the tape stopper as shown figure 1.
3. Tighten the screw (188).

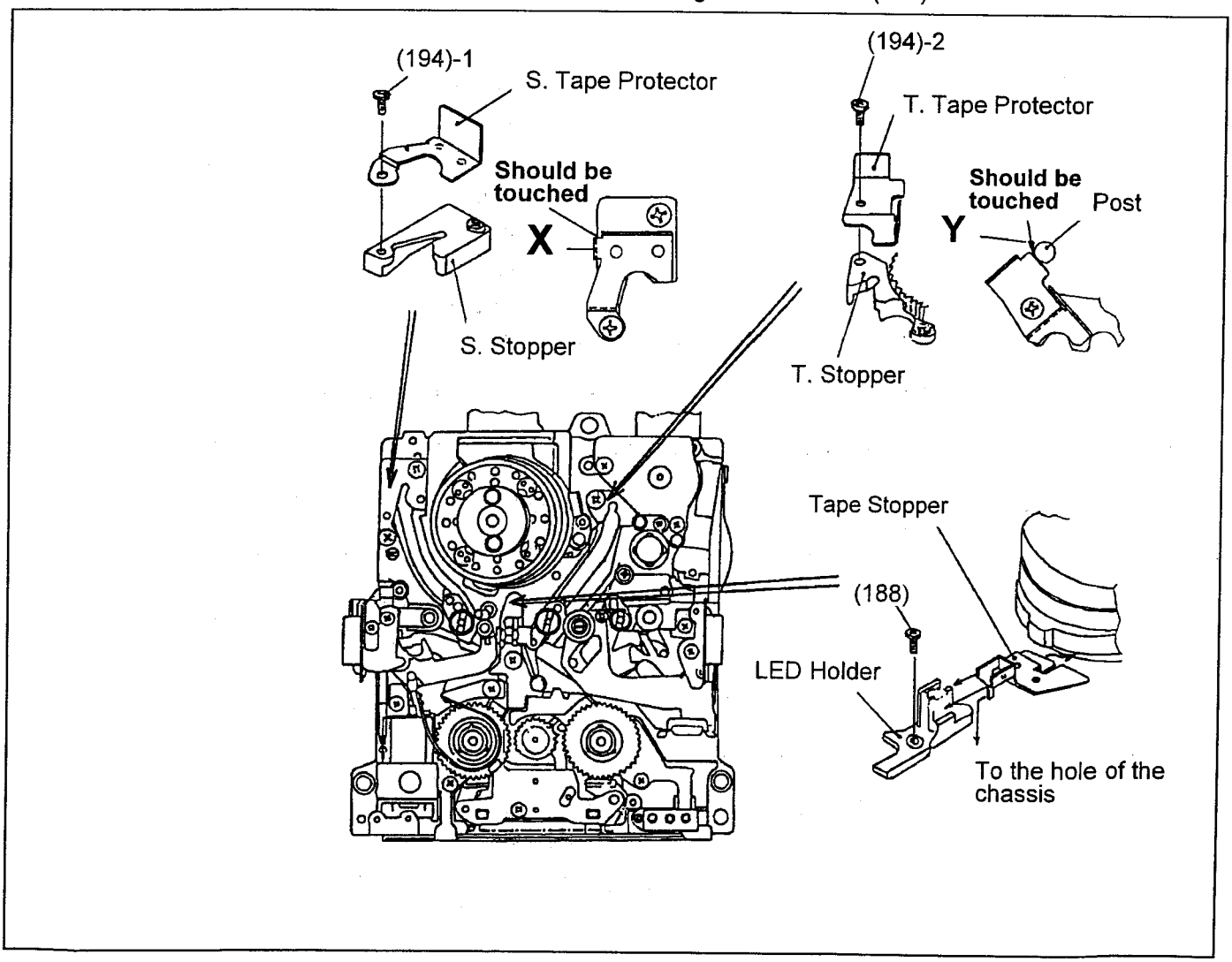

Fig. 1

4. Guide Arm Spring

1. Unscrew the screw (186) and Remove the tape beginning detector holder.
2. Remove the pinch roller spring from guide arm stopper.
3. Unscrew the screw (185) and remove the guide arm stopper.
4. Remove the T. guide arm roller arm.
5. Replace the guide arm spring.
6. Reassemble the above parts in the reverse steps.
7. When installing the guide arm stopper, add the washer between the chassis.

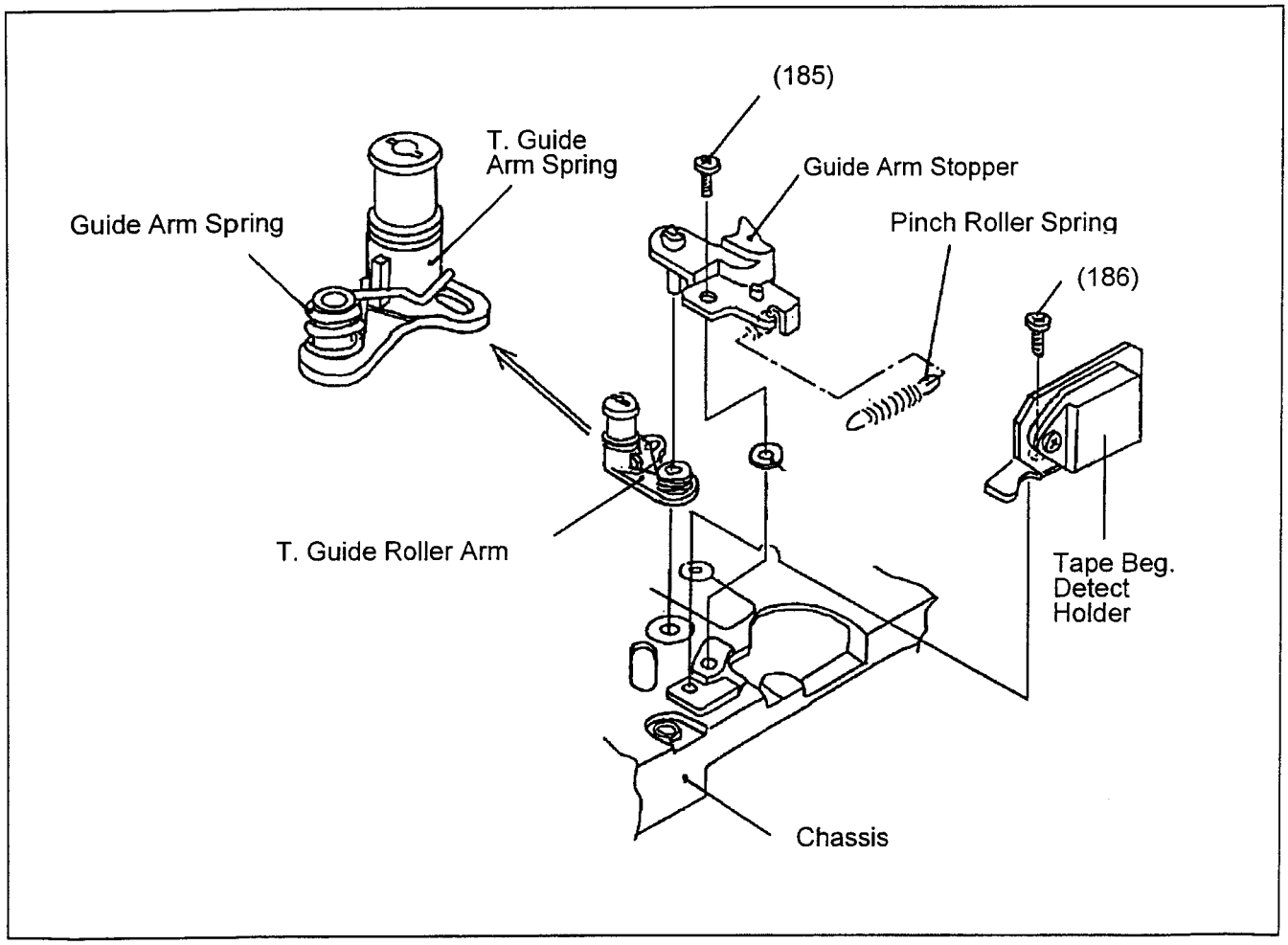

Fig. 2